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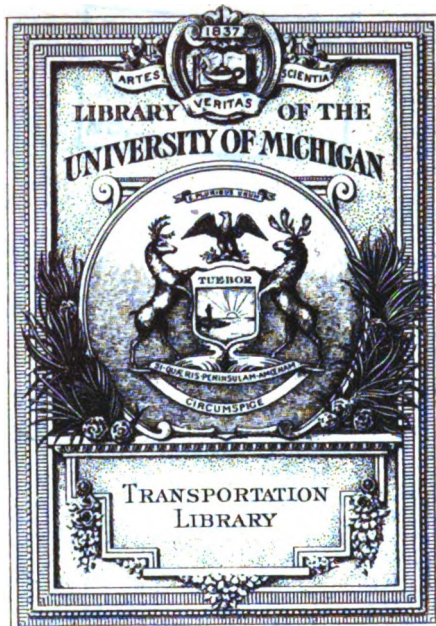
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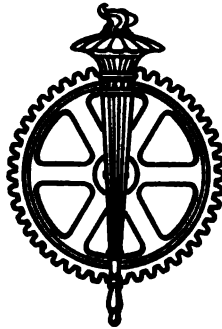
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TO THE USER

WITH this volume of **THE ENGINEERING INDEX**—the eighth since the work was first undertaken and the fourth since it assumed the “Annual” form—a continuous index to the engineering and technical literature of the past twenty-six years is made available to the reader. And in this book, as in the volumes issued for the last four years, the “classified” system of arranging the items is followed in place of the “strict alphabetic” order of the earlier volumes. In other words, the articles indexed are first grouped under the great divisions of engineering practice to which they belong—Civil, Mechanical, Electrical, Mining, etc.—and under these again they are sub-grouped according to the recognized special divisions of each field. After these two steps have been taken in sorting the miscellaneous literature of the day into closely related sections, the final arrangement under each section becomes strictly alphabetical.

This plan has always been followed in the monthly instalments of **THE ENGINEERING INDEX** as they have appeared in **THE ENGINEERING MAGAZINE**, and it has found wide favor with the Magazine’s readers. Experience with the **ENGINEERING INDEX ANNUALS** for 1906, 1907 and 1908 proved that it was equally acceptable to the consultants of these volumes. In the 1909 **ANNUAL** now presented, however, much additional care has been taken to serve the convenience of the users of the book. Thought and labor have been freely expended in the work of assembling the many thousand items so that articles on the same subject, though appearing at different times and in different periodicals, shall fall together as near as possible in the columns of the **ANNUAL**. The classifications have been somewhat amplified and made more distinct. Cross references have been most freely used so that the searcher for any subject may find a sign post leading him direct to his goal, on every path he is at all likely to try; and the typography of these cross-reference notes has been devised so that they may be most quickly understood.

The chief purpose of the “classified” plan of indexing is to collate, for each specialist, the entire current literature of his subject and to assemble it in a small space, where it may be readily found and completely explored. The railway superintendent of motive power, for example, who wants to keep in touch with the latest work done in his department, does not have to plod through all railroad literature alphabetically from “Air-Brake” to “Wreck,” looking up every possible word which might title an article of importance to him. He finds them all conveniently gathered into a brief space under the department of Railway Engineering and the sub-head Motive Power and

TO THE USER

Equipment, and on the adjoining pages before and after he may see everything published during the month on the closely allied subjects of Conducting Transportation and of Permanent Way. It is like running his eye over the shelves of a well-managed library. The literature he wants to know about is all there; perhaps, also, something very important he had not yet heard of, and therefore could not have looked up in an alphabetical list, is brought directly to his notice by this very Classified Index. This is possibly one of the greatest services the INDEX renders to its regular users.

In addition to this, the retention of the classified form has the very important advantage of permitting the issue of the volume annually, immediately after the close of each year, while the matter indexed is still fresh and at its maximum of serviceability. The old through-and-through alphabetic arrangement required a radical re-editing of every item that had appeared in the monthly parts of *THE ENGINEERING MAGAZINE*—so radical that it was practically equivalent to rewriting the entire work. In view of the limited outlet for the book, this undertaking was commercially inexpedient; professionally, it involved a heavy burden of service which could not be undertaken except at comparatively long intervals. It took about five years to recover from one volume and bring out another, and much of the literature of engineering becomes obsolete in five years.

The "Classification of the Index" facing the first page of the index notes should always be consulted before attempting to look up any given subject. The searcher will decide to which main division and sub-division of engineering the information he seeks logically belongs, and then turn to the page indicated in this "Classification." It will be observed that the catch-words indicating the first and last items on each page run in alphabetical order throughout the division indicated by the running heads to the pages.

Serial articles are indexed upon the appearance of the first instalment only, thus giving the searcher the clue by which the succeeding articles can be found. This rule has been waived in some instances of articles in two or three instalments, which are indexed entire.

When the great number of subjects dealt with is considered, as well as the fact that many important articles include several subjects, it will be realized that the classification has in many instances necessarily been a compromise between conflicting conditions; but it is believed that the system as a whole will serve the great purpose which has always been kept in view, that of guiding the searcher to his destination with a minimum of labor and uncertainty.

The comprehensive scope of the INDEX will be seen upon examination of the list of periodicals included. This comprises about two hundred and fifty publications, representing seventeen nations and colonies and six languages. About three-fourths of these journals are printed in English, the others being in German, French, Spanish, Italian, and Dutch. With every entry a brief descriptive note is given defining the scope and purport of the article, and in many cases this is sufficient for the purposes of the investigator and saves him

TO THE USER

the labor of further search. In general, however, the INDEX is used as a guide to the otherwise overwhelming mass of information contained in the huge files of the engineering periodicals stacked on the shelves of reference libraries throughout the world. The assembled sets of the great technical journals brought together in libraries such as those of the United Engineering Societies or the American Society of Civil Engineers in New York, or of the British Institution of Civil Engineers, might well overwhelm the time and patience of any individual who would search there for special information of which he had need. By this volume and its predecessors he is guided swiftly and accurately to the exact point he wishes to reach.

The work as a whole represents the continuation of that originally started by the late Professor J. B. Johnson in the *Journal of the Association of Engineering Societies* in 1884, and turned over by that association to *THE ENGINEERING MAGAZINE* at the close of 1895. The previous volumes, published in 1892, 1896, 1901, 1906, 1907, 1908, and 1909, respectively, covered with increasing fulness and thoroughness the field of periodical literature in engineering and closely related applied sciences. This latest volume brings the investigator down to the close of 1909, while the earlier parts enable searches such as occur in patent cases and the like to be prosecuted with a minimum of cost and delay.

REFERENCE LIST OF PERIODICALS

TITLES AND ABBREVIATIONS

In nearly every instance the abbreviated titles of periodicals indexed will be intelligible without further explanation, but in the following list all the titles are given, together with the addresses, in order that no possible difficulty may appear in the placing of references. The titles are arranged alphabetically in the order of the abbreviations, each being followed by the full title and place of publication. It is to be noted that *w*=weekly; *s.w*=semi-weekly; *m*=monthly; *s.m*=semi-monthly; *b.m*=bi-monthly; *q*=quarterly; *yr*=yearly.

Alliance Industrielle—Alliance Industrielle. *m.* Brussels.

Am Arch—American Architect. *w.* New York.

Am Engr & R R Jour—American Engineer and Railroad Journal. *m.* New York.

Am Gas Lght Jour—American Gas Light Journal. *w.* New York.

Amer Inst of Archts—American Institute of Architects. *yr.* New York.

Am Jour Sci—American Journal of Science. *m.* New Haven, Conn.

Am Mach—American Machinist. *w.* New York.

Am Rev of Revs—American Review of Reviews. *m.* New York.

Anales d l Soc Cien Argentina—Anales de la Sociedad Cientifica Argentina. *m.* Buenos Aires.

Ann d Ponts et Chauss—Annales des Ponts et Chaussées. *m.* Paris.

Anna della Societa d Ing e d Arch Ital—Annali della Societa degli Ingegneri e degli Architetti Italiani. *s.m.* Rome.

Ap Sci—Applied Science. *m.* Toronto.

Arch Rec—Architectural Record. *m.* New York.

Arch Rev—Architectural Review. *m.* Boston, Mass.

Arch't—Architect. *w.* London.

• **Arch't & Build's Mag**—Architect's and Builder's Magazine. *m.* New York.

Aust Min Stand—Australian Mining Standard. *w.* Melbourne.

Autocar—Autocar. *w.* Coventry, England.

Auto Jour—Automotor Journal. *w.* London.

Automobile—Automobile. *m.* New York.

Auto Topics—Automobile Topics. *w.* New York.

Beton u Eisen—Beton und Eisen. *s.m.* Vienna.

Boiler Maker—Boiler Maker. *m.* New York.

Brass Wld—Brass World. *m.* Bridgeport, Conn.

Br Build—Brick Builder. *m.* Boston, Mass.

REFERENCE LIST OF PERIODICALS.

- Brit Columbia Min Rec**—British Columbia Mining Record. *m.* Victoria, B. C.
Buider—Builder. *w.* London.
Bull Am Ir & St Assn—Bulletin of the American Iron and Steel Association. *w.* Philadelphia, Pa.
Bull Bur of Standards—Bulletin of the Bureau of Standards. Washington, D. C.
Bull Can Min Inst—Bulletin of the Canadian Mining Institute. *q.* Montreal.
Bull Am Inst Min Engrs—Bulletin of the American Institute of Mining Engineers. *b.m.* New York.
Bull du Lab d'Essais—Bulletin du Laboratoire d'Essais. Paris.
Bull Inter Ry Cong—Bulletin of the International Railway Congress. *m.* Brussels.
Bull Sci—Bulletin Scientifique. *m.* Liège, Belgium.
Bull Soc d'Encour—Bulletin de la Société d'Encouragement. *m.* Paris.
Bull Soc Int d'Electriciens—Bulletin de la Société Internationale d'Electriciens. *m.* Paris.
Bull Tech d I Suisse Rom—Bulletin Technique de la Suisse Romande. *s.m.* Lausanne, Switzerland.
Bull Univ of Illinois—Bulletin of the University of Illinois. Urbana, Ill.
Bull Univ Kansas—Bulletin of the University of Kansas. *b.m.* Lawrence.
Bull Univ Wis—Bulletin of the University of Wisconsin. Madison, Wis.
- Cal Jour of Tech**—California Journal of Technology. *m.* Berkeley.
Can Arch—Canadian Architect. *m.* Toronto.
Can Elec News—Canadian Electrical News. *m.* Toronto.
Can Eng—Canadian Engineer. *m.* Toronto and Montreal
Can Min Jour—Canadian Mining Journal. *s.m.* Toronto.
Cassier's Mag—Cassier's Magazine. *m.* New York and London.
Cement—Cement. *b.m.* New York.
Cement Age—Cement Age. *m.* New York.
Central Sta—Central Station. *m.* New York.
Chem, Met & Min Soc of S Africa—Chemical, Metallurgical and Mining Society of South Africa. *m.* Johannesburg.
Clay Rec—Clay Record. *s.m.* Chicago.
Cold Stor & Ice—Cold Storage and Ice. *m.* New York.
Col Guard—Colliery Guardian. *w.* London.
Col Univ Quar—Columbia University Quarterly. *q.* New York.
Com Veh—Commercial Vehicle. *m.* New York.
Compressed Air—Compressed Air. *m.* New York.
Comptes Rendus—Comptes Rendus de l'Académie des Sciences. *w.* Paris.
Con Rev—Contemporary Review. *m.* London.
Cons Repts—Consular Reports. *m.* Washington, D. C.
Cornell Civ Engr—Cornell Civil Engineer. *m.* Ithaca, N. Y.
- Deutsche Bau**—Deutsche Bauzeitung. *s.w.* Berlin.
Die Turbine—Die Turbine. *s.m.* Berlin.
Dom Eng—Domestic Engineering. *w.* Chicago.
Economic Geol—Economic Geology. *s.q.* South Bethlehem, Pa.
- Edin Rev**—Edinburgh Review. *q.* London.
Elec Age—Electrical Age. *m.* New York.
Elec Eng Lond—Electrical Engineer. *w.* London.
Elec Engng—Electrical Engineering. *w.* London.
Elec Jour—Electric Journal. *m.* Pittsburg, Pa.
Elect'n Lond—Electrician. *w.* London.

REFERENCE LIST OF PERIODICALS.

Elec Paris—Electricien. *w.* Paris.
Elec Rev—Electrical Review. *w.* New York.
Elec Rev Lond—Electrical Review. *w.* London.
Elec Ry Jour—Electric Railway Journal. *w.* New York.
Elec Wld—Electrical World. *w.* New York.
Electrochem & Met Ind—Electrochemical and Metallurgical Industry. *m.* New York.
Elek Kraft u Bahnen—Elektrische Kraftbetriebe und Bahnen. *w.* Munich.
Elektrochem Zeitschr—Elektrochemische Zeitschrift. *m.* Berlin.
Elektrotech Rundschau—Elektrotechnische und Polytechnische Rundschau. *w.* Potsdam.
Elektrotech u Maschinenbau—Elektrotechnik und Maschinenbau. *w.* Vienna.
Elektrotech Zeitschr—Elektrotechnische Zeitschrift. *w.* Berlin.
Elettricita—Elettricità. *w.* Milan.
Eng & Min Jour—Engineering and Mining Journal. *w.* New York.
Eng Mag—Engineering Magazine. *m.* New York and London.
Eng News—Engineering News. *w.* New York.
Engng—Engineering. *w.* London.
Engng-Contr—Engineering-Contracting. *w.* New York.
Eng Rec—Engineering Record. *w.* New York.
Eng Soc W Pa—Engineers' Society of Western Pennsylvania. *m.* Pittsburg, Pa.
Engr Lond—Engineer. *w.* London.

Foundry—Foundry. *m.* Cleveland, O.

Gas Engine—Gas Engine. *m.* Cincinnati, O.
Gas Engrs' Mag—Gas Engineers' Magazine. *m.* Birmingham, Eng.
Gas Wld—Gas World. *w.* London.
Génie Civil—Génie Civil. *w.* Paris.
Gesundheits-Ing—Gesundheits-Ingenieur. *w.* Munich, Bavaria.
Giesserei Zeit—Giesserei Zeitung. *s.m.* Berlin.
Giorn dei Lav Pubb e d Str Ferr—Giornale dei Lavori Pubblici e delle Strade Ferrate. *w.* Rome.
Glaser's Ann—Glaser's Annalen für Gewerbe und Bauwesen. *s.m.* Berlin.
Glückauf—Glückauf. *w.* Essen, Germany.

Harvard Engng Jour—Harvard Engineering Journal. *q.* Cambridge, Mass.
Heat & Ven Mag—Heating and Ventilating Magazine. *m.* New York.

Ice & Cold Stor—Ice and Cold Storage. *m.* London.
Ice & Refrig—Ice and Refrigeration. *m.* New York.
Il Cemento—Il Cemento. *m.* Milan.
Ind Advocate—Industrial Advocate. *m.* Halifax, N. S.
Ind Engng—Indian Engineering. *w.* Calcutta.
Ind Wld—Industrial World. *w.* Pittsburg, Pa.
Indus Engng—Industrial Engineering. *m.* Pittsburg.
Industria—Industria. *w.* Milan.
Ingenieria—La Ingenieria. *s.m.* Buenos Aires, Argentina.
Ingenieur—De Ingenieur. *w.* Hague.
Ing Ferro—L'Ingegneria Ferroviaria. *s.m.* Rome.
Ins Engng—Insurance Engineering. *m.* New York.
Int Marine Engng—International Marine Engineering. *m.* New York.

REFERENCE LIST OF PERIODICALS.

- Ir Age**—Iron Age. *w.* New York.
Ir & Coal Trds Rev—Iron and Coal Trades Review. *w.* London.
Ir Trd Rev—Iron Trade Review. *w.* Cleveland.
- Jour of Accountancy**—Journal of Accountancy. *m.* New York.
Jour Am Foundrymen's Assn—Journal of the American Foundrymen's Association. *m.* New York.
Jour Am Soc Mech Engs—Journal American Society of Mechanical Engineers. New York.
Jour Am Soc of Nav Engrs—Journal of the American Society of Naval Engineers. *q.* New York.
Jour Assn Eng Socs—Journal of the Association of Engineering Societies. *m.* Boston, Mass.
Jour Can Min Inst—Journal of the Canadian Mining Institute. *yr.* Montreal.
Jour Fr Inst—Journal Franklin Institute. *m.* Philadelphia, Pa.
Jour Ir & St Inst—Journal of the Iron and Steel Institute. *s.d.* London.
Jour N E Water Wks Assn—Journal of the New England Waterworks Association. *q.* Boston, Mass.
Jour Roy Inst of Brit Arch—Journal of the Royal Institute of British Architects. *s.m.* London.
Jour Roy United Service Inst—Journal Royal United Service Institute. *m.* London.
Jour San Inst—Journal of Sanitary Institute. *q.* London.
Jour S African Assn of Engs—Journal of South African Association of Engineers. *m.* Johannesburg.
Jour Soc Arts—Journal of the Society of Arts. *w.* London.
Jour Transvaal Inst of Mech Engrs—Journal of the Transvaal Institute of Mechanical Engineers. Johannesburg, S. A.
Jour U. S. Artillery—Journal of United States Artillery. *b.m.* Fort Monroe, Va.
Jour W of Scot Ir & St Inst—Journal West of Scotland Iron and Steel Institute. *m.* Glasgow.
Jour Worcester Poly Inst—Journal of Worcester Polytechnic Institute. *b.m.* Worcester, Mass.
Jour W Soc Engs—Journal of the Western Society of Engineers. *b.m.* Chicago.
- Locomotive**—Locomotive. *m.* Hartford, Conn.
- Mach**—Machinery. *m.* New York.
Marine Rev—Marine Review. *w.* Cleveland, O.
Mech Eng—Mechanical Engineer. *w.* Manchester, Eng.
Mech Wld—Mechanical World. *w.* London.
Mem Soc Ing Civ de France—Memoires de la Société des Ingenieurs Civils de France. *m.* Paris.
Métallurgie—Métallurgie. *w.* Paris.
Met Work—Metal Worker. *w.* New York.
Mines & Min—Mines and Minerals. *m.* Scranton, Pa.
Min Jour—Mining Journal. *w.* London.
Min & Sci Pr—Mining and Scientific Press. *w.* San Francisco, Cal.
Min Wld—Mining World. *w.* Chicago.
Mitt aus d Egl Tech Versuchsanst—Mittheilungen aus der Königlich Technischen Versuchsanstalt. Berlin.
Mitt d Ver f d Förd d Local u Strassenbahnwesens—Mittheilungen des Vereines für die Förderung des Local und Strassenbahnwesens. *m.* Vienna.
Mnfrcs Rec—Manufacturers' Record. *w.* Baltimore.

REFERENCE LIST OF PERIODICALS.

- Monit Indust**—*Moniteur Industriel*. *w.* Paris.
Motor Car Jour—*Motor Car Journal*. *w.* London.
Motorwagen—*Der Motorwagen*. *s.m.* Berlin.
Munic Engng—*Municipal Engineering*. *m.* Indianapolis, Ind.
Munic Jour & Eng—*Municipal Journal and Engineer*. *m.* New York.
- Nat Geog Mag**—*National Geographic Magazine*. *m.* Washington.
Nature—*Nature*. *w.* London.
Naut Gaz—*Nautical Gazette*. *w.* New York.
Nineteenth Cent—*Nineteenth Century*. *m.* London.
N Z Mines Rec—*New Zealand Mines Record*. *m.* Wellington.
- Oest Wochenschr f d Oeff Baudienst**—*Oesterreichische Wochenschrift für den öffentlichen Baudienst*. *w.* Vienna.
Oest Zeitsch f Berg- und Hüttenwesen—*Oesterreichische Zeitschrift für Berg- und Hüttenwesen*. *w.* Vienna.
- Phil Jour of Sci**—*Philippine Journal of Science*. *q.* Manila.
Plumb & Dec—*Plumber and Decorator*. *m.* London.
Pop Sci M—*Popular Science Monthly*. *m.* New York.
Power—*Power and the Engineer*. *w.* New York.
Prac Eng—*Practical Engineer*. *w.* London.
Pro Age—*Progressive Age*. *s.m.* New York.
Pro Am Inst Elec Eng—*Proceedings American Institute of Electrical Engineers*. *m.* New York.
Pro Am Inst Min Eng—*Proceedings American Institute of Mining Engineers*. *m.* New York.
Pro Am Soc Civ Eng—*Proceedings of the American Society of Civil Engineers*. *m.* New York.
Pro Am Soc Heat & Ven Eng—*Proceedings American Society of Heating and Ventilating Engineers*. New York.
Pro Am Water Works Assn—*Proceedings of the American Water Works Association*. *yr.* Charleston, S. C.
Pro Brooklyn Engrs Club—*Proceedings of the Brooklyn Engineers' Club*. *yr.* New York.
Pro Can Soc Civ Eng—*Proceedings of the Canadian Society of Civil Engineers*. *m.* Montreal.
Pro Central Ry Club—*Proceedings of the Central Railway Club*. *b.w.* Philadelphia, Pa.
Pro Engrs Soc of West Penn—*Proceedings of the Engineers Society of Western Pennsylvania*. *m.* Pittsburg, Pa.
Pro Inst Civ Eng—*Proceedings of the Institution of Civil Engineers*. London.
Pro Inst Elec Eng—*Proceedings of the Institution of Electrical Engineers*. London.
Pro Inst Mech Eng—*Proceedings of the Institution of Mechanical Engineers*. London.
Pro Inst Min & Met—*Proceedings of the Institution of Mining and Metallurgy*. *m.* London.
Pro Iowa Ry Club—*Proceedings of the Iowa Railway Club*. *m.* Des Moines, Iowa.
Pro N Y Ry Club—*Proceedings of the New York Railway Club*. *m.* New York.
Pro Pac Coast Ry Club—*Proceedings Pacific Coast Railway Club*. *m.* San Francisco, Cal.
Pro Ry Club of Pittsburg—*Proceedings of the Railway Club of Pittsburg*. *m.* Pittsburg, Pa.
Pro Soc Engrs—*Proceedings of the Society of Engineers*. London.
Pro S & S-W Ry Club—*Proceedings of the Southern and Southwestern Railway Club*. *yr.* Atlanta, Ga.
Pro St Louis Ry Club—*Proceedings St. Louis Railway Club*. *m.* St. Louis, Mo.
Pro U S Naval Inst—*Proceedings of the United States Naval Institute*. *q.* Annapolis, Md.

REFERENCE LIST OF PERIODICALS.

- Pro West Ry Club—Proceedings of the Western Railway Club. *m.* Chicago.
 Pub Works—Public Works. *q.* London.
- Qr Rev—Quarterly Review. *q.* London.
 Quarry—Quarry. *m.* London.
 Queensland Gov Min Jour—Queensland Government Mining Journal. *m.* Brisbane, Australia.
- Rev de Mécanique—Revue de Mécanique. *m.* Paris.
 Rev de Métallurgie—Revue de Métallurgie. *m.* Paris.
 Rev d'Econ Indus—Revue d'Economie Industrielle. *m.* Paris.
 Rev d'Electrochim et d'Electrométal—Revue d'Electrochimie et d'Electrométallurgie. *m.* Paris.
 Rev Indus—Revue Industrielle. *w.* Paris.
 Revist Tech Ind—Revista Tecnológico Industrial. *m.* Barcelona, Spain.
 Revue Gen des Chemins de Fer—Revue Générale des Chemins de Fer. *m.* Paris.
 Rivista Gen d Ferroire—Rivista Generale di Ferroire. *w.* Florence.
 Rivista Marittima—Rivista Marittima. *m.* Rome.
 R R Age Gaz—Railroad Age Gazette. *w.* New York.
 Rudder—Rudder. *m.* New York.
 Ry & Engng Rev—Railway and Engineering Review. *w.* Chicago.
 Ry & Loc Engng—Railway and Locomotive Engineering. *m.* New York.
 Ry Mas Mech—Railway Master Mechanic. *m.* Chicago.
- Schiffbau—Schiffbau. *s.m.* Berlin.
 Sch Mines Quar—School of Mines Quarterly. *q.* New York.
 Schweiz Bau—Schweizerische Bauzeitung. *w.* Zürich.
 Sci Am—Scientific American. *w.* New York.
 Sci Am Sup—Scientific American Supplement. *w.* New York.
 Sib Jour Engng—Sibley Journal of Engineering. *m.* Ithaca, N. Y.
 Sig Engr—Signal Engineer. *m.* Chicago.
 Soc Belge d Elec'ns—Société Belge des Electriciens. *m.* Brussels.
 Stahl u Eisen—Stahl und Eisen. *w.* Düsseldorf, Germany.
 Stevens Ind—Stevens Institute Indicator. *q.* Hoboken, N. J.
 Surveyor—Surveyor. *w.* London.
- Tech—Technograph. *yr.* Urbana, Ill.
 Tech Mod—La Technique Moderne. *m.* Paris.
 Tech Qr—Technology Quarterly. *q.* Boston, Mass.
 Tech Rev—Technology Review. *q.* Boston, Mass.
 Tram & Ry Wld—Tramway and Railway World. *m.* London.
 Trans Am Soc Nav Arch & Mar Engrs—Transactions of the American Society of Naval Architects and Marine Engineers. New York.
 Trans Assn of Civ Engrs of Cornell Univ—Transactions of the Association of Civil Engineers of Cornell University. Ithaca, N. Y.
 Trans Inst Eng & Ship in Scot—Transactions Institute of Engineers and Shipbuilders in Scotland. Glasgow.
 Trans N-E Coast Inst of Engrs & Shldrs—Transactions of the Northeast Coast Institute of Engineers and Shipbuilders. *m.* Newcastle-on-Tyne.
- U S Cons Repts—Consular Reports. *m.* Washington, D. C.

REFERENCE LIST OF PERIODICALS.

Wisconsin Engr—Wisconsin Engineer. *b.m.* Madison, Wis.

Wlds Work—World's Work. *m.* New York.

Wood Craft—Wood Craft. *m.* Cleveland, O.

Yacht—Le Yacht. *w.* Paris.

Yale Sci Month—Yale Scientific Monthly. *m.* New Haven, Conn.

Zeitschr d Mit Motorwagen Ver—Zeitschrift des Mitteleuropäischen Motorwagen Vereines.
s.m. Berlin.

Zeitschr d Oest Ing u Arch Ver—Zeitschrift des Oesterreichischen Ingenieur- und Architekten Vereines. *w.* Vienna.

Zeitschr d Ver Deutscher Ing—Zeitschrift des Vereines Deutscher Ingenieure. *w.* Berlin.

Zeitschr f d Gesamte Turbinenwesen—Zeitschrift für das Gesamte Turbinenwesen. *w.* Munich.

Zeitschr f Werkzeug—Zeitschrift für Werkzeugmaschinen und Werkzeug. *b.w.* Berlin.

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Arches.

Computation of Stresses in Open-Webbed Arches Without Hinges. C. W. Hudson. Gives a method for finding the stresses in every member of the arch due to a load at any point, or for any desired change in temperature. 1800 w. Pro Am Soc of Civ Engrs—Aug., 1909. No. 7363 E.

Conventional Live-Load Position for Maximum Stresses in Arches. William Cain. Investigates a given arch. 1500 w. Eng News—Feb. 4, 1909. No. 2275.

Experimental Verification of Arch Formulas. Malverd A. Howe. Describes experiments made to verify the results obtained by using the writer's summation formulas for the fixed arch as applied to ribs of reinforced concrete. Ills. 2500 w. R R Age Gaz—March 26, 1909. No. 3516.

A New Arch Curve, the Parabolic Oval. Charles Worthington. Gives a description illustrating the derivation of the curve, and some examples of its application, with working equations. 2500 w. Eng News—April 15, 1909. No. 3979.

The Stability of Arches. Henry Adams. Read before the Civ. & Mech. Engrs' Soc.

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A graphical study of the stresses. Ills. 3500 w. Surveyor—Feb. 12, 1909. No. 2585 A.

The Stability of Arches. Henry Adams. Read before the Civ. & Mech. Engrs. Soc. Discusses the conditions that must be fulfilled, giving a graphical method of determining stresses. 3000 w. Can Engr—May 28, 1909. No. 5156.

Determination of the Line of Resistance in Arches (Zur Berechnung des Stützliniengewölbes). Siegmund Schwätzer. Mathematical and theoretical. Ills. 7000 w. Oest Wochenschr f d Oeffent Baudienst—May 15, 1909. No. 5792 D.

The Spandrel-Braced Two-Hinged Arch (Der Zweigelenbogen mit Zugband). Th. Landsberg. Mathematical discussion of the method of determining the stresses in the members. Ills. 5500 w. Zeitschr d Ver Deutscher Ing—June 5, 1909. No. 6722 D.

Simplified Calculation of Rigid Arches on the Elastic Theory (Vereinfachte Berechnung von eingespannten Gewölben nach der Elastizitätstheorie). S. Sor. Mathematical demonstration of method. Ills. 2200 w. Beton u Eisen—Sept. 1, 1909. No. 8696 F.

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The Weights and Costs of Eight Lift Bridges. Data for a guide in making estimates. 1000 w. Engng-Con—Dec. 2, 1908. No. 803.

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Different Erection Methods for Scherzer Lift Spans. Illustrates and describes work in connection with improvements on the N. Y., N. H. & H. R. R. The Baychester bridge and the Bronx River bridge, both of the Scherzer type. 1000 w. Eng Rec—April 3, 1909. No. 3707.

A Heavy Strauss Bascule Bridge. Illustrated description of the double-track, single-leaf bascule over the Chicago River for the C. & N. W. Ry. 600 w. Ir Age—Dec. 17, 1908. No. 1035.

Bascule Bridge on the C. & A. Illustrates and describes the Page bascule bridge on the Chicago & Alton, and its working. 800 w. Ry & Loc Engng—Jan., 1909. No. 1446 C.

An Ornamental Bascule Bridge; Trunnion Bascule Across Coopers Creek, at Federal St., Camden, N. J. J. B. Strauss. Illustrated detailed description. 3500 w. Eng News—Feb. 4, 1909. No. 2272.

Bascule Bridges Over the East Chicago Canal. Illustrates and describes bridges of the Rall patented type of bascule bridge, four of which are to be built for railways crossed. 2500 w. Eng News—March 18, 1909. No. 3244.

The New Knippels Bridge at Copenhagen. Illustrations and particulars of a new bridge of the bascule type showing the ornamental possibilities. 1200 w. Sci Am—May 29, 1909. No. 5023.

A Novel Arrangement for a Rolling-Lift Bascule Bridge in Burma. Illustrated description of a bridge over the Ngawun River, giving 200 ft. clear channel. 800 w. Eng News—March 25, 1909. No. 3493.

Scherzer Rolling Lift Bridge Across Ngawun River, Burma. Illustrated description of a rolling-lift railway bridge. 800 w. Engr, Lond—Sept. 17, 1909. No. 8134 A.

Blackwell's Island.

The Safety and Carrying Capacity of the Blackwell's Island Bridge. Two Expert Reports. Reports of Henry W. Hodge and William H. Burr, setting forth in detail the condition of the structure. Also editorial. Ills. 13500 w. Eng News—Nov. 12, 1908. No. 232.

Stresses in the Blackwell's Island (Queensboro) Bridge Under Full Specified Loading. Gives stress sheet of Bolles and Hodge. 4000 w. Eng News—Nov. 19, 1908. No. 379.

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Reports on the Blackwell's Island Bridge. A statement of the conclusions of experts appointed to investigate this structure. Also editorial. 4200 w. Eng Rec—Nov. 7, 1908. No. 144.

The Cantilever Without Suspended Span. Appendices to the reports on this bridge. 2500 w. Eng Rec—Nov. 21, 1908. No. 417.

The Safety of the Blackwell's Island Bridge. Editorial discussion of the reports on the condition of this structure. 2000 w. Engng—Nov. 27, 1908. No. 867 A.

The Blackwell's Island Bridge Blunder. Editorial criticism. 2500 w. Engng—Con—Nov. 25, 1908. No. 711.

Safety of the Queensboro Bridge. From the report of a commission of engineers to the Pennsylvania Steel Company. 2000 w. Ir Age—June 17, 1909. No. 5567.

Further Reports Upon the Blackwell's Island (Queensboro) Bridge Over the East River. Reports concerning this structure, with editorial comment. 7000 w. Eng News—June 17, 1909. No. 5580.

The Strength of the Queensboro Bridge. Henry S. Prichard. Analysis of the various reports on the safety of the bridge. Also editorial. 9000 w. Ind Engng—July 15, 1909. No. 6678 C.

The Blackwell's Island Bridge. Editorial on a pamphlet issued by the Penn. Steel Co. giving expert testimony in regard to its strength. 1800 w. R R Age Gaz—Sept. 10, 1909. No. 7694.

Blackwell's Island Bridge, New York. Frank W. Skinner. Illustrated detailed description of this bridge and the methods of construction. 3500 w. Engng—Aug. 20, 1909. Serial, 1st part. No. 7440 A.

Nickel-Steel Eye-Bars for Blackwell's Island Bridge. William R. Webster. A summary of the preliminary experimental tests made, with tabulated results. 3000 w. Pro Am Soc of Civ Engrs—March, 1909. No. 3498 E.

The Footwalks of the Blackwell's Island Bridge. F. W. Abbott, and J. P. H. Perry. Outlines the design of these footwalks and describes their construction. Ills. 6000 w. Eng News—Jan. 28, 1909. No. 2150.

Cantilever.

Erection of the New River Bridge at Glen Lyn, Va., by the Cantilever Method. L. L. Jewel. Illustrated detailed description of the structure and methods of erection. 3000 w. Eng News—July 8, 1909. No. 6223.

See also Viaducts and Blackwell's Island, under BRIDGES.

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Concrete Bridge Specifications. T. H. McDonald. Read before the Iowa Assn. of Cement Users. Discusses the requirements of such specifications. 1200 w. Cement Age—April, 1909. No. 4079.

Concrete in Arched Bridge Construction. E. P. Wells. Lecture at the Concrete Institute on the construction of such bridges, with abstract of its discussion. 4000 w. Builder—April 3, 1909. No. 3887 B.

Concrete in Highway Bridge Abutments. A. W. Campbell. Presents its advantages and discusses the design, dimensions and permanence. 2500 w. Con Rec—May 12, 1909. No. 4676.

Concrete in Important Railroad Work. James W. Phillips. Illustrated account of its utility in abolishing grade crossings of the Philadelphia & Reading Ry. in Philadelphia. 1200 w. Cement Age—Oct., 1909. No. 8753.

Short-Span Bridges in Philadelphia. Concrete and steel railroad and highway bridges recently built in the suburbs are illustrated and described. 1500 w. Eng Rec—March 13, 1909. No. 3112.

Some Concrete Culverts and Small Bridges on the Slateford-Hopatcong Cut-Off of the Delaware, Lackawanna & Western R. R. Illustrated descriptions. 1200 w. Eng News—Sept. 30, 1909. No. 8206.

The Stress Sheets and Some Construction Details of a 280-ft. Span Rubble Concrete Arch Bridge at Cleveland, Ohio. Illustrated description of general structural features of the Rocky River arch, with stress computations. 2000 w. Engng Con—March 10, 1909. No. 3093.

The Monroe St. Bridge, Spokane, Washington; A Concrete Bridge Containing a 281-ft. Arch. Illustrated detailed description of a bridge soon to be constructed which will contain the longest concrete arch yet attempted. 1500 w. Eng News—Sept. 2, 1909. No. 7534.

An Elastic Arch Concrete Bridge. Illustrated description of a reinforced-concrete arch treated as a perfectly elastic structure. The bridge, which carries a highway over railroad tracks, is known as the Scenery Hill Viaduct. 1500 w. Eng Rec—June 26, 1909. No. 6002.

The Construction of the Edmondson Avenue Bridge, Baltimore. Illustrated detailed description of methods used in constructing a bridge with three arch spans of 60 ft. and one of 139 ft. 3500 w. Eng Rec—Aug. 14, 1909. No. 7071.

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A 259-Ft. Concrete Arch Bridge in Switzerland. Illustrated description of details of design and erection of the Sitter arch bridge. 2500 w. Eng News—Aug. 5, 1909. No. 6906.

See also Abutments, Culverts, and Reinforced Concrete, under BRIDGES; and Grade Reduction, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS.

Culverts.

The Design of Culverts and Sewers. Abstract of a paper by Ernest McCullough, before the Ill. Soc. of Engrs. and Surv. A study of earlier structures and the theories of their design. 2500 w. Eng Rec—Feb. 27, 1909. No. 2851.

Relative Economy in Cost of Culvert Construction. E. W. Cooper. Gives cost estimates based on the cost to the railroad company having the work done. 1500 w. Can Engr—April 30, 1909. No. 4378.

The Standard Reinforced Concrete Culvert Construction of the Iowa State Highway Commission. Illustrations and particulars of examples of concrete culverts and highway bridges. 1000 w. Engng-Con—March 3, 1909. No. 3028.

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Design.

Stray Thoughts on Bridge Design and Maintenance. Herbert C. Keith. Extracts from a paper read before the Conn. Soc. of Civ. Engrs. Discusses timber floor details, cast-iron shims in trestles, paint, etc. 2500 w. Eng News—July 29, 1909. No. 6772.

Stray Thoughts on Bridge Design and Maintenance. Herbert C. Keith. Read before the Conn. Soc. of Civ. Engrs. Calls attention to details that affect the life and strength of materials. 4000 w. Engng-Con—Aug. 4, 1909. No. 6901.

Live-Loads and the Life of Railway Bridges. For What Loading Should Railway Bridges Be Designed? Editorial discussion. 1200 w. Eng News—Sept. 16, 1909. No. 7899.

The Calculation of Stresses in Stiffening Trusses. F. E. Turneure. An appendix to the report by Ralph Modjeski on the Manhattan Bridge. Gives the derivation of formulae. 1200 w. Eng Rec—Oct. 9, 1909. No. 8438.

Drawbridges.

The Temporary Bridge Across the Cornwall Canal and the Permanent Repairs to the Canal Break. Describes a

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temporary drawbridge at Cornwall, Ont., having many interesting features, and also the permanent work on the canal. Ills. 2000 w. Eng News—Dec. 17, 1908. No. 982.

Swing Bridge Across the Weaver Navigation. Illustrated description of a structure chiefly noteworthy on account of the novel arrangement of the ball-bearing pivot on which it swings. 1200 w. Engr, Lond—Oct. 8, 1909. No. 8939 A.

Weaver Drawbridge Lift-Rail Locking. Illustrated description of this apparatus. 1200 w. Sig Engr—Nov., 1908. No. 280.

The Kaiser Wilhelm Swing Bridge at Wilhelmshafen, Germany (Le Pont Tour-nant Kaiser Wilhelm à Wilhelmshafen, Allemagne). Illustrated detailed description. 1800 w. Génie Civil—Sept. 11, 1909. No. 8630 D.

Earthquakes.

A Study of the Damage to Bridges During Earthquakes. William Herbert Hobbs. Read before the Am. Assn. for the Adv. of Science. Gives data from earthquakes of recent date. Ills. 5000 w. Jour of Geol—Oct.-Nov., 1908. No. 492 D.

End-Launching.

Erection of the French River Bridge of the Canadian Pacific Railway. Illustrates and describes the conditions, and methods of erecting by end-launching a bridge of one 415-ft. riveted through truss span and two 60-ft. deck-plate-girder spans. 2500 w. Eng Rec—Jan. 30, 1909. No. 2176.

Bridge Erection by the End-Launching Method (Lançage des Ponts au Moyen de Chalands). Ch. Dantin. Describes the work of erecting the Kyrönalmi-Sund bridge in Finland and the French River bridge in Canada. Ills. 1600 w. Génie Civil—Dec. 5, 1908. No. 1925 D.

Erection.

Derrick Cars and Bridge Erection. J. H. Prior. A fully illustrated article describing the designs and features of such cars, their operation and uses. Also gives tests of iron pulley blocks, and general discussion. 10000 w. Jour W Soc of Engrs—Aug., 1909. No. 7422 D.

Derrick Cars for Bridge Erection. Illustrated description of designs, described by J. H. Prior in a paper before the Western Society of Engineers. 2500 w. Eng Rec—March 6, 1909. No. 2973.

Handling Complete Bridge Spans. Illustrates and describes work on the Lehigh & New England in which the spans were assembled off the bridge, then brought into position over the old truss and hung from gallows frames. The

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old truss was then removed and the new truss lowered into position. 1200 w. R Age Gaz—March 12, 1909. No. 3097.

Erection of the Tremont Avenue Bridge, New York. Illustrates and describes an ingenious system of erection with powerful steel derricks and a gallow frame. 2000 w. Eng Rec—July 3, 1909. No. 6173.

The Erection of the Richelieu River Bridge. Illustrates and describes methods of erecting double track spans, to replace single-track spans, using old piers, without interfering with regular trains on the Grand Trunk Ry. 1000 w. Eng Rec—July 24, 1909. No. 6647.

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Failures.

The Collapse During Reconstruction of a Span of the Baltimore & Ohio R. R. Bridge Across the Susquehanna. An illustrated account of this accident, describing the construction, the collapse, and the condition of the wreckage. 2500 w. Eng News—Oct. 1, 1908. No. 214.

The Collapse of a Reinforced-Concrete Bridge Across the Illinois River at Peoria, Ill. Information concerning this bridge and the accident, received from various sources. Ills. 6000 w. Eng News—May 13, 1909. No. 4649.

The Peoria Bridge Failure. Account of the collapse of a concrete bridge, due to bad foundations. Ills. 1800 w. Cement Age—July, 1909. No. 6442.

Floors.

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Reinforcing the Glens Falls Highway Bridge Floor. Illustrates and describes an ingenious system. 1500 w. Eng Rec—March 13, 1909. No. 3110.

Foot Bridges.

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Design of a Two-Span Foot Bridge (Berechnung eines Fussgängersteges von 2 Oeffnungen). R. Necker. Mathemat-

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ical description of the design of elevated street crossings. Ills. Serial. 1st part. 1000 w. Elektrotech Rundschau—May 8, 1909. No. 5950 D.

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Foundations.

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Foundations for a Concrete Bridge. George A. McKay. Describes work in connection with the erection, by the D. L. & W. R. R., of a large bridge across the Delaware River. Ills. 2000 w. Harvard Eng Jour—Jan., 1909. No. 3194 D.

Pile-and-Cylinder Foundations of Norfolk & Western Bridge No. 5, Elizabeth River, at Norfolk, Va. J. E. Crawford. Outlines the history of this bridge, and gives illustrated description of the structure as recently rebuilt. 4500 w. Eng. News—June 10, 1909. No. 5460.

Foundation Work for C. and N. W. Railroad Bridge Across the Mississippi River at Clinton, Iowa. M. Deutsch. Illustrated description of the construction of foundations for one of the longest continuous truss-span bridges in the world. Ills. 3500 w. Sch of Mines Qr—July, 1909. No. 7891 D.

Junction Curves.

A Note on Some Junction Curves (Note sur diverses Courbes de Raccordement). M. Auric. Shows the solution of several problems which arose during the construction of a bridge over the Rhone. Ills. 3000 w. Ann des Ponts et Chauss—1908 IV. No. 1309 E + F.

Lift Bridges.

Lift Bridges. An illustrated discussion of many types of movable bridges. 17500 w. Pro Engrs' Soc of W Penn—Feb., 1909. No. 3454 D.

Electrically Operated Lift Bridge, the "New Bridge," at Cette (Le Pont Neuf, Pont-levant à Manœuvre Electrique au Port de Cette). M. Herrmann. Illustrated description of the construction and operating mechanism of this bridge, the middle span of which is lifted vertically to allow the passage of boats. 4300 w. Ann d Ponts et Chaussées—1908-III. No. 502 E + F.

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Live Loads.

Digest and Criticism of the Published Investigations on the Oscillations of a Beam under a Rolling Load (Darstellung

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und Kritik der in der Literatur vorliegenden Untersuchungen über Schwingungen eines Trägers mit bewegter Last). Edmund Bühler. Mathematical. Serial. 1st part. 5000 w. Glasers Ann—Sept. 1, 1909. No. 8681 D.

Maintenance.

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Manhattan.

The Queensboro and Manhattan Bridges Across the East River. Illustrated article dealing with the opening of the Queensboro bridge and work of completing the Manhattan bridge. 1200 w. Sci Am—April 10, 1909. No. 3839.

Progress on the Manhattan Bridge. Describes recent work on the cables, the machines used, special falsework, floor system, etc. Ills. 3000 w. Eng Rec—July 31, 1909. No. 6793.

The Design and Construction of the Manhattan Bridge. A summary of the Manhattan bridge report by Ralph Modjeski, wholly favorable to the structure. 3500 w. Eng Rec—Oct. 2, 1909. No. 8234.

Modjeski's Report on Design and Construction of the Manhattan Bridge Over the East River at New York City. Full report, with illustrations, favorable to the structure. 7500 w. Eng News—Oct. 14, 1909. No. 8564.

The Construction of the Manhattan Bridge Approaches. Illustrated description. 1500 w. Eng Rec—Nov. 21, 1908. No. 414.

The Manhattan Bridge Approach Viaducts. Illustrated detailed description. 2000 w. Eng Rec—Oct. 31, 1908. No. 27.

Erection of the Suspended Superstructure of the Manhattan Bridge, New York. Describes the general arrangement of the plant, and the methods used. 1800 w. Eng Rec—April 3, 1909. No. 3698.

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Masonry.

On Preservation Work at the Old Bridge of Ayr. Arthur Hamilton Wilson. Describes pointing the surface of the bridge, construction of cross walls, etc., underpinning the piers, cutting out and replacing damaged stones. Ills. 1200 w. Inst of Civ Engrs—No. 3798. No. 6450 N.

The 180-Ft. Stone Arch Bridge at Wiesen, Switzerland. Illustrations and information of an arch of unusual proportions built on a meter-gage branch railway in Switzerland. 2000 w. Eng News—Sept. 16, 1909. No. 7895.

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The Arciat Bridge (Note sur le Pont d'Arciat). M. Parent. Illustrated description of a masonry bridge over the Saône, of seven 31-metre spans. 3300 w. Ann d Ponts et-Chaussées—1909-II. No. 5716 E + F.

New York.

Our Four Big Bridges. Montgomery Schnyler. A critical study of the aesthetic and scientific qualities of the East River bridges at New York City. 5500 w. Arch Rec—March, 1909. No. 2915 C.

The Bridges of New York City. T. Kennard Thomson. An illustrated discussion of their design, construction, and chief traffic relations. Serial, 1st part. 3000 w. Engineering Magazine—Sept., 1909. No. 7416 B.

The Bridges of New York City. T. Kennard Thomson. In this second article the East River bridges and the smaller structures of Brooklyn, Queens, and Richmond are considered. Ills. 3000 w. Engineering Magazine—Oct., 1909. No. 8174 B.

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Piers.

The Construction of the River Piers of the Pierre Bridge. Illustrated description of work in South Dakota, on a river subject to floods. 2500 w. Eng Rec—April 3, 1909. No. 3710.

The Reconstruction of a Pier of the Poughkeepsie Bridge. Illustrates and describes details of new columns, girders, and bracing. 1500 w. Eng Rec—Sept. 25, 1909. No. 8066.

Construction of the Beaver Bridge Piers. Detailed description of the methods used in constructing this bridge across the Ohio River. 2000 w. Eng Rec—Sept. 11, 1909. No. 7671.

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Plate Girders.

Plate Girder Web Splices. C. R. Young. Discusses the design of web splices, criticizing various arrangements. Ills. 4500 w. Ap Sci—Jan., 1909. No. 2093 C.

Pontoons.

Design of an Iron Pontoon Foot-Bridge (Construction und Berechnung einer eisernen Schiffslandebrücke für Fussgänger). W. Schulz. Mathematical. Ills. 1500 w. Elektrotech Rund—Aug. 28, 1909. No. 7989 D.

Design and Construction of an Iron Pontoon Foot Bridge (Construction und Berechnung einer Schwimmenden eisernen Fussgängerbrücke). W. Schulz. Mathe-

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matical. Ills. Serial. 1st part. 1700 w. Elektrotech Rundschau—Oct. 17, 1908. No. 590 D.

Quebec.

Secondary Stresses in Large Epan Bridges. Editorial review of the report of C. C. Schneider to the Quebec Bridge Commission, discussing the cause of the failure and the best course to be pursued in replacing the structure. 2500 w. Engng—Jan. 29, 1909. No. 2361 A.

Reconstruction.

Reconstruction of Approach Spans, Poughkeepsie Bridge. Describes reconstruction work made necessary by traffic requirements. 2200 w. Eng Rec—Oct. 9, 1909. No. 8436.

Reinforcing a Highway and Street Railway Bridge. Describes methods used for strengthening the steel work of the Washington bridge over the Housatonic River in Connecticut. 1800 w. Eng Rec—May 15, 1909. No. 4697.

Replacing Short Span Railroad Bridges Under Traffic. Illustrated description of methods used on the Auburn Div. of the Lehigh Valley R. R. 1000 w. Eng Rec—Sept. 11, 1909. No. 7669.

The Widening of Blackfriars Bridge. An illustrated review of the methods for completing the superstructure. 1200 w. Engng—March 5, 1909. No. 3164 A.

The Widening of Blackfriars Bridge. Illustrated detailed description of the engineering features of the work, and other information. Plates. 5000 w. Engng—Sept. 10, 1909. No. 7864 A.

See also Piers, under BRIDGES.

Reinforced Concrete.

Concrete Bridges. Frank Barber. Discusses some of the concrete and reinforced concrete bridges and the reasons for their popularity. Ills. 2500 w. Can Engr—March 5, 1909. No. 3005.

The Concrete Arch vs. the Concrete Girder Bridge. Frank Barber. Compares two recent reinforced concrete bridges as to efficiency and cost. Ills. 1200 w. Can Engr—Nov. 20, 1908. No. 404.

Cost of Concrete Bridges. Henry H. Quimby. Read before the Nat. Assn. of Cement Users. General discussion of first cost and maintenance cost as compared with steel. 1500 w. Eng Rec—Jan. 23, 1909. No. 2026.

Costs of Reinforced Concrete Bridges. Especially with Regard to Maintenance. E. P. Goodrich. Extracts from a paper read at the Cleveland convention of the Nat. Assn. of Cement Users. 1500 w. Cement Age—April, 1909. No. 4078.

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Comparative Construction and Maintenance Costs of Reinforced Concrete and Steel Bridges. E. P. Goodrich. Read before the Nat. Cement Users Assn. 6500 w. Engng-Con—March 17, 1909. No. 3235.

A Criticism of the Reinforced-Concrete Bridge Truss. Editorial. 1200 w. Eng News—April 22, 1909. No. 4163.

Calculation of the Reinforced-Concrete Bridge Over the Amper at Esting (Statistische Berechnung der Eisenbetonbalkenbrücke bei Esting an der Amper). Hans Popp. A mathematical paper describing the designing a bridge of three spans, each 12.84 metres long. Ills. 2800 w. Beton u Eisen—Dec. 14, 1908. No. 1985 F.

Transverse Beams in Girder Bridges (Querträger bei Balkenbrücken). K. Oswald. Mathematical discussion of their design. Ills. 2500 w. Beton u Eisen—April 23, 1909. No. 5052 F.

The Mill River Bridge of the New York, New Haven & Hartford Railroad. Illustrated description of this six-track railroad bridge, consisting of two arches of reinforced concrete. 2500 w. Eng Rec—Nov. 14, 1908. No. 255.

The Construction of the Pelham Bridge, New York. Illustrated detailed description of the general design and the construction operations of a concrete bridge with pile foundations. 2500 w. Eng Rec—Oct. 31, 1908. No. 20.

Walnut Lane Bridge, Philadelphia. George S. Webster and Henry H. Quimby. Illustrated description of this bridge, notable for the great size of its main arch, discussing the principles of its design, the reasons for its special features, and the lessons learned in course of its construction. 13500 w. Pro Am Soc of Civ Engrs—Aug., 1909. No. 7364 E.

The Wyoming Avenue Arch Bridge at Philadelphia. Illustrated description of two concrete highway bridges of the same general dimensions and construction. 1000 w. Eng Rec—Feb 27, 1909. No. 2846.

The Edmondson Avenue Bridge, Baltimore. A four-span concrete arch structure, carrying roadway and sidewalks, is illustrated and described. 1800 w. Eng Rec—June 19, 1909. No. 5623.

Method and Cost of Constructing a Reinforced Concrete Arch Street Bridge at Baltimore, Md. Relates to the construction of the Stony Run Bridge. 1700 w. Engng-Con—Aug. 4, 1909. No. 6898.

Contractors' Plant on the Connecticut Avenue Bridge, Washington. An outline of the principal plant and operations and the complete location plan. The cost of

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the falsework was about \$50,000. 2500 w. Eng Rec—April 3, 1909. No. 3705.

The Rocky River Concrete Bridge Near Cleveland, O. Illustrates and describes a reinforced-concrete viaduct with a central arch having a clear span of 280 ft. 2500 w. Eng Rec—Jan. 23, 1909. No. 2020.

The Grand River Bridge of the Lake Shore & Michigan Southern Railway. Illustrated description of a recently completed four-track, reinforced-concrete arch bridge. 3000 w. Eng Rec—April 24, 1909. No. 4167.

The Construction of the Grand River Bridge. Illustrated description of unusual construction methods used for this four-track reinforced-concrete arch bridge of the L. S. & M. S. Ry. near Painesville, Ohio. Also editorial. 4500 w. Eng Rec—May 1, 1909. No. 4389.

The Mississippi River Boulevard Bridge at St. Paul. Illustrated description of a reinforced-concrete structure. 1200 w. Eng Rec—April 3, 1909. No. 3704.

An Economical Long Span Reinforced Concrete Highway Bridge. William J. Watson. Read before the Ohio Engng. Soc. Illustrates and describes a bridge recently completed over the Vermillion River, at Wakeman, Ohio. 3500 w. Engng-Con—Feb. 24, 1909. No. 2767.

Concrete Work on Sparkman St. Bridge, Nashville, Tenn. W. F. Creighton. An illustrated article describing particularly the reinforced-concrete approaches, and concrete piers. 8000 w. Eng News—Feb. 25, 1909. No. 2753.

Construction Methods on Two Highway Bridges, Nashville, Tenn. Detailed description, principally of the piers and the viaduct approaches of reinforced concrete, of the Sparkman and the Jefferson St. bridges. Ills. 2800 w. Eng Rec—Feb. 13, 1909. No. 2449.

A Reinforced Concrete Arched Rib—Fixed Ends. A. W. Miller. Drawings and explanation of methods of designing a proposed 12th street bridge, at Oakland, Cal. 5000 w. Cal Jour of Tech—Feb., 1909. No. 3502.

Computation of a Reinforced-Concrete Arch Rib with Fixed Ends for a Proposed 12th Street Bridge at Oakland, California. A. W. Miller. Mathematical discussion with diagrams. Ills. 9100 w. Engng-Contr—June 2, 1909. No. 5308.

The Galveston Causeway. F. E. Lister. Illustrated detailed description of a proposed concrete causeway to connect Galveston Island and the mainland. 2200 w. R. R. Age Gaz—June 11, 1909. No. 5471.

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Concrete in the Galveston Causeway. H. Prime Kieffer. Illustrates and describes the construction of this causeway, which will join the island to the mainland, and especially the extensive use of concrete. 2500 w. *Mfrs' Rec*—July 15, 1909. No. 6318.

Lynhurst Bridge. A. Gillies. Illustrated description of a reinforced concrete span of 116 feet, built in St. Thomas, Canada. 1200 w. *Can Engr*—Dec. 4, 1908. No. 842.

Cost Account of Seine River Bridge, St. Boniface. Estimate of cost for a reinforced concrete bridge in Manitoba. 1500 w. *Can Engr*—Jan. 15, 1909. No. 1773.

The Market House Bridge at Monterrey, Mexico. Lloyd B. Smith. Illustrated description of a reinforced concrete bridge carrying an arcade of stores. 1000 w. *Eng News*—April 8, 1909. No. 3849.

Some Reinforced Concrete Bridges in France. Illustrates and describes two railway and one foot bridge recently constructed, designed by M. A. Considère. 1500 w. *Engr, Lond*—Oct. 30, 1908. No. 197 A.

The Application of Spiral Hooping to a French Concrete Bridge. Illustrates and describes details of a bridge at Avranches, France. 700 w. *Eng News*—April 22, 1909. No. 4162.

The Pyrimont Bridge Over the Rhone (Pont en Béton armé sur le Rhone, à Pyrimont). G. Espitallier. Illustrated description of this concrete arch bridge on masonry piers. 3500 w. *Génie Civil*—Jan. 16, 1909. No. 2640 D.

The Birkendorf Bridge Over the Feistritz (Die Feistritzbrücke in Birkendorf). Gustav Hermann. Describes and discusses the design of this reinforced-concrete arch. Mathematical. Plates. Ills. 5500 w. *Oest Wochenschr f d Oeffent Baudienst*—May 29, 1909. No. 5794 D.

The Gmünder Bridge, Switzerland (Die Gmünder Tobel-Brücke bei Teufen, Schweiz). A. Sutter. Illustrated description of design and construction of this reinforced concrete arch of 79 metres span. Serial. 1st part. 1200 w. *Deutsche Bau*—Nov. 7, 1908. No. 1156 B.

The Gmünder Bridge near Teufen, Switzerland (Die Gmündertobel-Brücke bei Teufen in Kanton Appenzell). E. Mörsch. Illustrated description of a high reinforced concrete arch of 79 metres span. Serial. 1st part. 1700 w. *Schweiz Bau*—Feb. 13, 1909. No. 3384 B.

A Bridge Over the Oberspree Near Berlin (Die Stubenrauch-Brücke über die

Oberspree bei Berlin). Karl Bernhard. Illustrated description of a bridge having two reinforced-concrete spans and one steel span. Serial, 1st part. 5000 w. *Zeitschr d Ver Deutscher Ing*—Dec. 5, 1908. No. 1997 D.

Highway Bridge over a Canal in Ravensburg (Strassenbrücke über den Schussenkanal in Ravensburg). H. Pilgrim. Mathematical description of a bridge of 6.8 metres span. Ills. Serial. 1st part. 2300 w. *Beton u Eisen*—Sept. 1, 1909. No. 8695 F.

The Sinlunkaba (Burma) Ferro-Concrete Bridge. W. E. Haldwell. Describes methods adopted in constructing a reinforced-concrete arch. Ills. 3000 w. *Soc of Engrs*—June 7, 1909. No. 5663 N.

See also Arches, Concrete, Culverts, Failures, Foundations, Steel, Trestles, Viaducts and Waterways, under BRIDGES; and Floods, under WATERWAYS AND HARBORS.

Removal.

Removal of Madison Avenue Drawbridge, New York City. George H. Hefele. Illustrates and describes the successful removal of the draw-span from the old bridge to the temporary structure. 1800 w. *Eng News*—Dec. 31, 1908.

Replacement.

Replacing a Double-Track Skew Bridge and Viaduct. Plans and description of methods of replacing the entire superstructure without obstructing the tracks below or interrupting train service. 2000 w. *Eng Rec*—May 8, 1909. No. 4577.

Erection of Delaware River Bridge at Portland, Pennsylvania. Illustrated description of methods used in replacing an entire steel superstructure, on the old substructure, without interrupting traffic on a single-track bridge. 4000 w. *Eng Rec*—April, 1909. No. 3709.

Replacing a Lehigh Valley Railroad Bridge. Illustrated account of bridge 444 A on the Buffalo Division which was erected without interruption of traffic of any of three railroads concerned. 1000 w. *Eng Rec*—Oct. 16, 1909. No. 8593.

Roller Bearings.

Provision for Expansion in Bridges (Notes sur les Appareils de Dilatation des Ponts). A. Nachtergal. Discusses the theoretical considerations in providing for expansion, and the types of bearings used. Ills. 2800 w. *All Indus*—March, 1909. No. 4228 D.

Skew.

See Replacement, under BRIDGES.

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Skew Portals

Skew Portals.

The Detailing of Skew Portals. J. P. Davies. Gives formulæ for the computation, directions for layout, etc. Diagrams. 3000 w. Eng News—Feb. 11, 1909. No. 2397.

Steel.

Steel Railroad Bridges. R. G. Manning. A discussion of present practice, dealing with location, type, loading, specifications, design, fabrication, inspection, transportation, erection and maintenance. General discussion follows. 8500 w. Pro Ry Club of Pittsburgh—Feb. 26, 1909. No. 3809 C.

Bridge Designing. Carl Gayler. Remarks on work of the past forty years, drawing lessons from the Quebec bridge failure and discussing the Eads bridge in comparison. 3500 w. Jour Assn of Engng Socs—March, 1909. No. 4908 C.

Proportioning Bridge Members for Impact. Editorial reviewing briefly methods of proportioning bridge members, and considering certain impact formulæ. 2500 w. Eng Rec—May 8, 1909. No. 4570.

A Simplified Method for the Graphical Calculation of Bridge Trusses. J. H. Griffith. Explains a method for the graphical calculation of chord and web stresses. 700 w. Eng News—Feb. 25, 1909. No. 2762.

The Theory of Secondary Stresses in Trusses. John H. Griffith. Gives a suggested method of computation for Manderla's problem. 6000 w. Mich Tech—Feb., 1909. No. 4072 D.

Tables for Calculating Inertia of Built-Up Girders. H. F. Harris. Gives useful tables for shortening time necessary for calculations. 1000 w. Mech Engr—April 23, 1909. No. 4455 A.

Nickel Steel Eye-Bars. Editorial discussion of W. R. Webster's paper on "Nickel Steel Eye-Bars for Blackwell's Island Bridge," submitted to Am. Soc. of Civil Engineers. 1500 w. Eng Rec—June 5, 1909. No. 5276.

Concerning High Unit-Stresses in Steel Bridge Design. Editorial on the tendency toward using higher unit-stresses, considering that there is no valid reason for the change. Also discusses the causes. 3000 w. Eng News—Nov. 19, 1908. No. 380.

Live Loads and Working Stresses in Railway Bridges. Conrad Gribble. Compares present and past conditions. 3000 w. Cassier's Mag—Feb., 1909. No. 2330 B.

Diagrams for Rivet Pitch in Loaded Girder Flanges. P. L. Pratley. Diagrams and explanatory notes. 700 w. Eng News—Feb. 18, 1909. No. 2524.

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The Erection of Girder Bridges. Frank W. Skinner. An illustrated article, the present number considering the handling girders at the shop, loading on cars, handling at bridge site, and examples of erection with derricks. 4500 w. Eng Rec—April 10, 1909. Serial, 1st part. No. 3863.

Stresses in Transverse Beams Rigidly Connected to Horizontal Girders (Nebenspannungen der Querträger infolge steifer Längsträgeranschlüsse). Ivan Arnovlevic. Mathematical. Ills. 2000 w. Oest Wochenschr f d Oeffent Baudienst—Sept. 18, 1909. No. 8694 D.

Accurate Design of Parallel Girders with a Double System of Diagonals and Posts (Genauere Berechnung von Parallelträgern mit einem doppelten System von Zugdiagonalen und Ständern). Friedrich Hartmann. Describes method. Mathematical. Ills. 5700 w. Zeitschr d Oest Ing u Arch Ver—July 17, 1909. No. 7457 D.

Parabolic Bridges (Ponts paraboliques). A. Nachtergal. A mathematical and graphical demonstration of the method of determining length of members. Ills. 2000 w. All Indus—Feb., 1909. No. 3326 D.

Light and Heavy Bridges (Ponts lourds et Ponts légers). M. Pendaries. Describes two types of light, strong and cheap bridges, of steel girders, reinforced with concrete. Ills. 10000 w. Ann d Ponts et Chaussées—1908-VI. No. 3314 E + F.

The Pitch of Rivets in Built-Up Girders (Ueber Nietteilung in Blechträgern). G. Kapsch. A mathematical discussion. Ills. 3000 w. Oest Wochenschr f d Oeff Baudienst—Nov. 7, 1908. No. 1181 D.

The Protection of Steel Bridges (Sulla Conservazione die Ponti in Ferro). Discusses the problems of corrosion and protective coatings. Serial. 1st part. 3000 w. Ing Ferro—Nov. 1, 1908. No. 1138 D.

The Atlantic Avenue Bridge Extension, Boston. Illustrated detailed description of difficult work. 2500 w. Eng Rec—April 3, 1909. No. 3700.

Some Features of the Bridges on the Harlem River Branch of the New York, New Haven and Hartford Railroad. Herbert C. Keith. Plans and description of bridges on a branch carrying a heavy freight business, and carrying the railway over many streets. Discussion. 9500 w. Pro Brooklyn Engrs' Club, No. 84—1908. No. 5875 E + F.

A Protected Steel and Concrete Highway Bridge. Illustrates and describes a bridge carrying Tremont Ave. over a number of tracks of the N. Y., N. H. & H. R. R. and is of interest on account

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of the heavy construction and for details of the concrete floor and concrete protection of the steel from locomotive gases and corrosion. 1200 w. Eng Rec—Feb. 20, 1909. No. 2563.

Short-Span Bridges Over City Crossings. Illustrates and describes the short-span steel bridges recently built under agreement of the City of New York, in connection with extensive railway improvements. 3000 w. Eng Rec—July 10, 1909. Serial. 1st part. No. 6257.

The City's Giant Bridges. Illustrated descriptions of the four large bridges crossing the East River at New York. 3500 w. Sci Am—Dec. 5, 1908. No. 813.

Erection of Additional Girders—Williamsburg Bridge Towers. Illustrated description of method of strengthening this bridge for increased capacity. 1800 w. Eng Rec—Aug. 21, 1909. No. 7302.

Steel and Reinforced Concrete Bridge Superstructures for the Bay Ridge Improvement of the Long Island Railroad. James B. French. Gives general description of this work and the details mentioned. Ills. 7000 w. Pro Brooklyn Engrs' Club. No. 82—1908. No. 5873 F + F.

Recent Short-Span Highway Bridges. Illustrated description of bridges at Ithaca, N. Y., carrying Buffalo and Seneca Streets over the Cayuga Inlet. 1300 w. Eng Rec—March 27, 1909. No. 3540.

The Communipaw Avenue Bridge, Central Railroad of New Jersey. A 200-ft. highway bridge, spanning seven tracks in Jersey City, erected without interruption to traffic. 1000 w. Eng Rec—Feb. 13, 1909. No. 2453.

Central of New Jersey Bridge Renewal at Bethlehem. Plan, photographs, and description of the old and new structures, and of the methods of erection. 800 w. R R Age Gaz—Feb. 5, 1909. No. 2298.

The Erection of the Susquehanna River Bridge of the Baltimore and Ohio Railroad. Illustrated description of steel-truss bridge work at Aikin, Md. 3300 w. Eng Rec—April 3, 1909. No. 3719.

The 42 St. Bridge, Philadelphia, Pa.; An Arch with Steel Ribs Filled Between with Concrete. Plans and description of a combination steel and concrete highway bridge having novel features. 3000 w. Eng News—May 20, 1909. No. 4777.

A Combination Steel and Concrete Arch Bridge. Illustrated description of a bridge being erected in Philadelphia, to carry 42d street over 15 tracks of the Pennsylvania R. R. 2000 w. Eng Rec—May 22, 1909. No. 4923.

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Steel Arch Bridge at Scranton, Pa. Illustrated description of a three-span bridge with reinforced concrete superstructure, massive steel pier columns filled with concrete and two lines of riveted deck trusses supporting a reinforced concrete floor. 2000 w. Eng Rec—Dec. 12, 1908. No. 959.

The McKeesport & Port Vue Bridge. Illustrated detailed description of this highway bridge across the Youghiogheny River. It has a steel superstructure and concrete floor. 1200 w. Eng Rec—Nov. 28, 1908. No. 692.

The Mercantile Bridge across the Monongahela River. Illustrated detailed description of a bridge 1857½ ft. long between abutments and a clear height of 54 ft. 1500 w. Eng Rec—Dec. 19, 1908. No. 1054.

The Webster-Donora Bridge. Illustrated description of a highway bridge across the Monongahela River. 1500 w. Eng Rec—June 12, 1909. No. 5490.

New Bridge of the Kanawha & Michigan Ry. Over the Ohio River at Pt. Pleasant, W. Va. J. A. Stocker. Illustrated description of rebuilt bridge and approaches, describing methods of erection. 3500 w. Eng News—Sept. 9, 1909. No. 7623.

The Sparkman and Jefferson Street Bridges, Nashville, Tennessee. Illustrated detailed description of two long, high bridges over the Cumberland River, of three steel-truss spans and reinforced concrete viaduct approaches. 2500 w. Eng Rec—Feb. 6, 1909. No. 2303.

The Fort Snelling Bridge. Illustrated detailed description of the design and construction of this highway bridge across the Mississippi river. 1700 w. Eng Rec—June 26, 1909. No. 5999.

The New Bridge Crossing the Mississippi River at Clinton, Ia.; Chicago & Northwestern Ry. F. H. Bainbridge. Gives the history of earlier bridges at this point, and illustrated detailed description of the new structure. 7000 w. Eng News—Jan. 21, 1909. No. 1874.

Rio Conchos Bridge of the Kansas City, Mexico & Orient. W. W. Colpitts. Illustrated description of a bridge of 17 spans of 50 ft. deck-plate girders, supported on plain concrete piers and reinforced concrete abutments. 2800 w. R R Age Gaz—Jan. 22, 1909. No. 2001.

The New Railroad Bridge at Vancouver. J. Mayne Baltimore. Brief illustrated description of the largest, longest and most expensive railway bridge on the American continent. 700 w. Sci Am Sup—Feb. 27, 1909. No. 3576.

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The Long Span Riveted Truss French River Bridge. Illustrated detailed description. The most interesting feature is the special construction of the main end bearings. 1500 w. Eng Rec—Aug. 28, 1909. No. 7387.

A Curious Highway Bridge. S. E. Fitch. Illustrated description of a structure near Havana, Cuba. 500 w. Eng News—July 8, 1909. No. 6228.

Difficult Bridge Work in Great Britain. A short summary of interesting erection work, with illustrations. 3500 w. Eng News—July 1, 1909. No. 6085.

Bridge Over the River Wear at Sunderland. Illustrated description of a double-deck bridge of unusually large proportions, and the methods of erection. Plates. 3500 w. Engng—Oct. 23, 1908. No. 76 A.

The New Bridge Over the Wear. Illustrates and describes this double-deck road and railway bridge erected by the N.-E. Ry. Co., and the Sunderland Corporation. 1200 w. Engr, Lond—June 4, 1909. Serial. 1st part. No. 5536 A.

Reconstruction of the Caledonian Railway Bridge, Stirling. Illustrated detailed description of recently completed work on a bridge over the River Forth. 1800 w. Engng—Dec. 4, 1908. Serial. 1st part. No. 1017 A.

The King Edward VII Bridge, Newcastle on Tyne. Frank William Davis and Cyril Reginald Sutton Kirkpatrick. Describes the foundations, approaches, superstructure and its erection, cableways, etc. Ills. Discussion. 27000 w. Inst of Civ Engrs—No. 3742. No. 3210 N.

The Reconstruction of the Humboldt Bridge of the Berlin Railway (Die Auswechslung der Humboldthafenbrücke der Berliner Stadtbahn). Herr Wambsganss. Illustrates and describes important work in strengthening this steel bridge. Serial. 1st part. 4000 w. Glasers Ann—Oct. 1, 1908. No. 584 D.

The Replacement of the Humboldt Harbor Bridges in Berlin (Die Auswechslung der Humboldthafen-Brücken in Berlin). C. Müller. Describes the work of rebuilding and the new structure. Ills. 2500 w. Zeitschr d Ver Deutscher Ing—Jan. 30, 1909. No. 2842 D.

Some Railway Bridges on the West Coast of Tasmania. James Bannatyne Lewis. Illustrates and describes the erection of bridges with limited resources. 3000 w. Inst of Civ Engrs—No. 3710. No. 888 N.

Sydney Harbor Bridge. Describes a scheme which is to cost about £2,000,000.

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Suspension Cables

1200 w. Engr, Lond—Nov. 6, 1908. No. 328 A.

I. The Curzon Bridge at Allahabad. Robert Richard Gales. II. The Netravati Bridge at Mangalore. Archibald Scott Napier. General description of construction and costs of two bridges in India. Discussed together. 35800 w. Plates. and Ills.—Inst of Civ Engrs—No. 3626 and No. 3733. No. 3208 N.

The Doumer 1,680-Metre Bridge Over the River Rouge at Hanoi, Tonkin (Le Pont Doumer de 1,680 Mètres d'Ouverture sur le Fleuve Rouge à Hanoi, Tonkin). Illustrated detailed description. 4000 w. Génie Civil—April 3, 1909. No. 4834 D.

The Song-Ma Railway Bridge (Pont de Chemin de Fer sur le Song-Ma, Tonkin). Ch. Dantin. Illustrates and describes the construction of a bridge of novel design. 3000 w. Génie Civil—May 8, 1909. No. 5738 D.

Railway Bridge Over Shiré River, Nyasaland. Illustrated description of a lifting bridge of rather novel design. 500 w. Engng—July 23, 1909. No. 6855 A.

The Gualaguay River Bridge. J. R. Garrod and P. J. Ridsen. Explains the unusual conditions, and gives illustrated description of the design and construction. Plate. 2500 w. Engng—July 23, 1909. No. 6848 A.

See also Arches, Bascule, Blackwell's Island, Concrete, Drawbridges, Erection, Failures, Floors, Foot Bridges, Junction Curves, Manhattan, Plate Girders, Pontons, Reinforced Concrete, Replacement, Roller Bearings, Suspension, and Viaducts, under BRIDGES.

Suspension.

The Stresses in a Suspension Bridge. L. H. Chase. Gives a simple method of calculating the stresses by simple mathematics. 3000 w. Engr, Lond—May 7, 1909. Serial. 1st part. No. 4728 A.

The Gisclard Suspension Bridge over the Cassagne (Pont suspendu fixe, Système Gisclard, de la Cassagne, Pyrénées-Orientales). G. Leinekugel Le Cocq. Illustrated description of the structure and its construction. Serial. 1st part. 4000 w. Génie Civil—Feb. 20, 1909. No. 3344 D.

The Trellins Suspension Bridge (Notice sur la Construction du Pont suspendu de Trellins près Vinay). M. Buisson. Describes a bridge of the "semi-rigid" type. Ills. 3800 w. Ann d Ponts et Chaussées—1908-VI. No. 3315 E + F.

Suspension Cables.

Construction of the Manhattan Bridge Cables. Illustrates and describes methods used. 4000 w. Eng Rec—Dec. 5, 1908. No. 830.

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Swing Bridges

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Viaducts

Swing Bridges.

An English Double-Deck Swing Bridge for Railway and Roadway Traffic. Drawings and detailed description of the double-track swing bridge with unequal arms, crossing the river Avon at Bristol, England. 4500 w. Eng News—Aug. 19, 1909. No. 7138.

The Kaiser Wilhelm Bridge at Wilhelmshafen (Die Kaiser Wilhelm-Brücke in Wilhelmshafen). Karl Bernhard. Illustrated description of this interesting double swing structure. Serial. 1st part. 2700 w. Zeitschr d Ver Deutscher Ing—May 22, 1909. No. 5966 D.

See also Drawbridges, under BRIDGES.

Timber.

A Recent All-Wood Truss, Railroad Bridge. Illustrated description of a through-truss bridge, on B. & M. R. R., of about 100 feet clear span. 1800 w. Eng Rec—Oct. 23, 1909. No. 8703.

Method and Cost of Constructing a Wooden King Post Truss Bridge with Concrete Abutments in Cuba. Charles M. Kercher. Description and cost data. Diagrams. 500 w. Engng-Con—Nov. 11, 1908. No. 240.

Transporter.

See Transporter Bridges, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING.

Trestles.

Ferro-Concrete Coal Tip and Viaduct at Sharpness Docks. Reviews the history of these docks, illustrating and describing recent improvements. 1500 w. Engr, Lond—Jan. 15, 1909. No. 2084A.

The Design, Construction, and Cost of a Reinforced Concrete Trestle. C. C. Mitchell. Illustrated description and information concerning the construction of a reinforced concrete incline on Catskill Mountain, N. Y. 3500 w. Eng Rec—Feb. 20, 1909. No. 2568.

A Heavy Reinforced-Concrete Trestle. Illustrated description of a long, high structure at Youngstown, Ohio. 2000 w. Eng Rec—April 3, 1909. No. 3706.

Reinforced-Concrete Trestles with Pile Bents and Girder-Slab Spans: Chicago, Burlington & Quincy Ry. Illustrated description of the construction. 2500 w. Eng News—May 20, 1909. No. 4779.

Viaducts.

The Stability of Viaducts (Remarques sur la Stabilité des Viaducs). M. Bonneau. Mathematical discussion. 8000 w. Ann d Ponts et Chaussées—1909-I. No. 4813 E + F.

The Greenville Bridge of the Boston & Maine Railroad. Illustrates and describes the erection of a steel viaduct over 611 ft. long, carrying a single track nearly 100 ft. above the Sonhegan River. 2000 w. Eng Rec—Feb. 27, 1909. No. 2850.

Difficult Erection of the Providence Viaduct. Illustrates and describes the construction of a steel viaduct about 1,200 ft. long, in connection with improvements by the N. Y., N. H. & H. R. R. 3800 w. Eng Rec—April 3, 1909. No. 3702.

Erection of the Arches of the Mulberry Street Viaduct, Harrisburg. Illustrates and describes the construction of the arches and roadway system of this reinforced concrete structure. 3800 w. Eng Rec—April 3, 1909. No. 3690.

The Sligo Reinforced Concrete Viaduct. Brief illustrated description of a highway viaduct in Takoma Park, Md. 1500 w. Eng Rec—May 15, 1909. No. 4687.

A Reinforced-Concrete Viaduct With Some Structural Steel Reinforcement, Takoma Park, Md. Illustrated description of a structure in which I-beams are employed as the basis of the reinforced-concrete beams and struts wherever possible. 1000 w. Eng News—July 1, 1909. No. 6084.

The Cuyahoga Viaduct of the New York, Chicago & St. Louis Railroad. A double track steel bridge of Cleveland, O., having a length of about 3,010½ ft., crossing a river, several streets and a number of tracks. 2000 w. Eng Rec—Jan. 9, 1909. No. 1574.

Replacing the Cuyahoga Valley Viaduct, Cleveland, Ohio. Describes a new steel viaduct, and its erection. Ills. 3500 w. Eng Rec—June 5, 1909. No. 5286.

The Pleasant Run Bridge of the Cincinnati, New Orleans and Texas Pacific Railway. Illustrated description of a new steel structure in Kentucky. 1500 w. Eng Rec—Jan. 9, 1909. No. 1572.

Early Construction Methods on the Grand Avenue Viaduct. The erection of this viaduct in Milwaukee, Wis., is illustrated and described. 2500 w. Eng Rec—May 22, 1909. No. 4925.

The Highland Boulevard Viaduct, Milwaukee. Illustrated description of a reinforced-concrete viaduct across a wide, deep ravine. 2200 w. Eng Rec—June 12, 1909. No. 5487.

The Sixth Street Viaduct, Kansas City. E. E. Howard. Illustrated detailed description of a steel structure, about 8000 ft. long, carrying elevated roadway and

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Viaducts

two car tracks across the valley of the Kaw River. 17500 w. Pro Am Soc of Civ Engrs—Feb., 1909. No. 3459 E.

The Bear River Viaduct; Nevada County Narrow Gauge R. R., Colfax, Cal. Brief illustrated description of a viaduct containing a double cantilever construction of novel design. 1000 w. Eng News—March 11, 1909. No. 3100.

Great Engineering Works on the Canadian Pacific Railway. J. E. Schwitzer. Read before the British Assn. at Winnipeg. Describes the huge Lethbridge viaduct in Alberta, and the grade reduction in the Canadian Rockies. Ills. 7000 w. Can Engr—Sept. 17, 1909. No. 7834.

I. The Erection of the Pwll-y-pant Viaduct on the Brecon and Merthyr Extension of the Barry Railway. Alexander Low Dickie. Illustrated detailed description of the work. II. Notes on the Erection of Cantilever Bridges. Thomas Claxton Fidler. Two papers discussed together. 11800 w. Inst of Civ Engrs. No. 3596 & No. 3740. No. 2797 N.

Erection of the Fades Viaduct. Illustrated description of a railroad viaduct in France, notable for the exceptional height of the masonry pillars, and the length of the central span. 1000 w. Sci Am—Oct. 9, 1909. No. 8412.

The Fades Viaduct Over the Sioule (Achèvement du Viaduc des Fades sur

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Boring

la Sioule). Describes a long, high, steel viaduct on the Puy-de-Dôme railway. Ills. 3000 w. Génie Civil—May 29, 1909. No. 5742 D.

The Erection of the Fades Viaduct (Construction et Montage du Viaduc des Fades). L. Le Chatelier. Illustrated description of the erection of this long, high, steel structure over the valley of the Sioule. 5300 w. Bul Soc d'Encour—July, 1909. No. 7916 G.

The Assopos Viaduct, Greece (Le Viaduc de l'Assopos, Greece). Georges Bodin. Illustrated description of this steel viaduct 176 metres long with an 80-metre arch span. 4000 w. Génie Civil—Aug. 14, 1909. No. 7935 D.

The Makatote Viaduct. Illustrated description of this steel viaduct on the North Island Main Trunk Ry. of New Zealand. Plate. 1800 w. Engng—Sept. 3, 1909. No. 7747 A.

See also Elevated Railways, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS.

Waterways.

A Comparison of Bridge Waterways. Daniel B. Luten. Read before the Indiana Engng. Soc. A comparison of the rectangular, the egg-shape, and the arch types, with special reference to reinforced-concrete construction. Ills. 2500 w. Munic Engng—Feb., 1909. No. 2336 C.

CONSTRUCTION

Beams.

Oblique Loading. W. S. Kinne. Gives graphical methods for the solution of the general problem of flexure of straight beams of uniform cross-section for loads in any plane. 4000 w. Wis Engr—Dec., 1908. No. 2733 D.

Lateral Strength of Beams. H. D. Hess. A discussion applicable only to present standard structural shapes. 900 w. Pro Engrs' Club of Phila—April, 1909. No. 7114 D.

A Note on the Deflection Due to Shear. W. C. Popplewell. Gives a method of determining the deflection due to shear as separate from that due to direct stresses. 1800 w. Engr, Lond—Sept. 24, 1909. No. 8367 A.

The Calculation of Elastic Fixed and Continuous Beams with Variable Moment of Inertia (Ueber die Berechnung elastisch eingespannter und kontinuierlicher Balken mit veränderlichem Trägheitsmoment). Max Ritter. Mathemati-

cal. Ills. Serial. 1st part. 2000 w. Schweiz Bau—May 1, 1909. No. 5766 B.

Rigidly Connected Continuous Beams (Poutres à Travées Solidaires). M. Levaillant. Mathematical demonstration of a rapid method of obtaining bending-moment and shearing-stress curves. Ills. 5500 w. Ann d Ponts et Chaussées—1909-III. No. 7123 E + F.

See also Reinforced Concrete, under CONSTRUCTION.

Boring.

Test-Boring Methods. Investigations for New Bridges at Santa Cruz, Cal. James K. James. Illustrated description of drilling methods. 2500 w. Cal Jour of Tech—Oct., 1908. No. 343.

Methods and Costs of Making Wash Borings on a Ship Canal Survey. A. W. Saunders. Illustrates the drills used and gives a report of the difficulties encountered. 1000 w. Engng Con—Dec. 9, 1908. No. 923.

See also Foundations, under BRIDGES; and Wells, under WATER SUPPLY.

Brick

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Columns

Brick.

Experiments to Determine Pressure of Concrete on Forms. Francis R. Spunk. Abstract from "*Prof. Mem.*" Engrs' Bureau, U. S. A. An account of experiments made at Lock No. 1, on the Mississippi River between St. Paul and Minneapolis, to determine the pressure of concrete on forms at various temperatures and rates of filling. Ills. 1400 w. Engng-Con—Aug. 25, 1909. No. 7342.

The Supervision of Brickwork. Suggestions for inspection, selection of bricks, the mortar, and features of the work. 2500 w. Builder—Aug. 28, 1909. No. 7632 A.

A High Record in Bricklaying Attained by Novel Methods. L. W. Peck. Illustrated description of methods giving a large output per man and low cost per thousand, in construction work at Chelsea, Mass. 2500 w. Eng News—Aug. 5, 1909. No. 6911.

Reinforcement for Ordinary Walls (Impiego della Lamiera stirata per Armare la Muratura ordinaria). A. Anastasi. Describes a type of reinforcement applicable to brick and masonry walls, for use in earthquake countries. Ills. 1000 w. Ann d Soc d Ing e d Arch Ital—July 1, 1909. No. 7238 F.

The Edison Concrete House. Illustrates and describes this invention for providing comfortable and sanitary homes for workmen at moderate cost. 1200 w. Sci Am—Aug. 28, 1909. No. 7379.

The Auditorium-Armory Building in Atlanta, Georgia. Plans and description of a brick building on concrete footings, on firm clay. The interior construction consists of a combination of frame, steel and concrete. 2000 w. Eng Rec—May 8, 1909. No. 4576.

See also Concrete Blocks, Retaining Walls, and Stacks, under CONSTRUCTION; and Sewers, under MUNICIPAL.

Building Costs.

Comparative Cost of Reinforced-Concrete, Stone, Brick and Frame Buildings. Oliver Randolph Parry. Gives contractors' estimates, with comments. 900 w. Cement Age—May, 1909. No. 4754 C.

Building Raising.

Raising Large Brick Buildings in Galveston, Texas. Describes methods used in raising St. Patrick's Church, and the Broadway School. Ills. 1200 w. Eng Rec—April 3, 1909. No. 3697.

Caissons.

Pneumatic Caissons on the North-South Line of the Paris Subway. William F. Johnston. An illustrated descrip-

tion of the caisson work in the river beds and the two large underground stations in the Cité and in Place St. Michel. 2500 w. Eng Rec—Feb. 27, 1909. No. 2844.

Cement Brick.

A Mill Building of Cement Brick Construction for the Plymouth Cordage Co. A. M. Bradford. Illustrated description. 2500 w. Eng News—March 18, 1909. No. 3240.

Chalmette Monument.

Work of Completing Chalmette Monument. An illustrated account of the work of completing an abandoned monument erected to the honor of Andrew Jackson, and those who lost their lives in the great battle. 3000 w. Jour Assn of Engng Socs—Sept., 1909. No. 8767 C.

Coal Bunkers.

Reconstructing Coal Bunkers in a Steam Power Plant. Explains the difficulties of work carried out in New York City in reconstructing coal bunkers destroyed by fire. 3200 w. Eng Rec—Nov. 14, 1908. No. 250.

Coal Pockets.

A Large Steel Coal Storage Building. Illustration and brief description of storage shed and conveyor at Wende, N. Y. 1000 w. Eng Rec—Sept. 4, 1909. No. 7556.

Ferro-Concrete Coal Storage Plant. Illustrated description of coal silos and their mechanical equipment as installed at the Clayton West and Skelmanthorpe Collieries. 1000 w. Col. Guard—Jan. 22, 1909. No. 2216 A.

Elevated Reinforced Concrete Coal Store. Illustrated description of a structure recently erected in Montreal. 1200 w. Engr, Lond—June 11, 1909. No. 5637 A.

See also Coaling Plants, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS.

Columns.

The Strength of Compression Members. Edward Godfrey. Aims to show that the strength of a column considered as a spring is independent of the elastic strength of the material. Also that the Gordon-Rankine formula leads sometimes to dangerous conclusions. 3000 w. R R Age Gaz—July 2, 1909. No. 6128.

The Theory of Eccentrically-Loaded Columns, Including the Influence of Shear Distortion. Harry S. Prichard. Gives problems and results of special cases showing the influence of shear on deflection and illustrating the theory of eccen-

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Columns

trically loaded columns. Mathematical study. 4000 w. Eng News—Feb. 25, 1909. No. 2755.

The Rankine-Gordon and Euler's Formulae for Columns. W. E. Lilly. Aims to show that if the analysis on which Euler's formula is based is correctly interpreted, it really leads to the Rankine-Gordon formula; and that if Euler's formula is rational, so also is the Rankine-Gordon formula. 1300 w. Engng—July 2, 1909. No. 6302 A.

The Strength of Solid Cylindrical Round-Ended Columns. W. E. Lilly. Read at Dublin meeting of British Assn. for the Pro. of Science. Describes experiments made to determine the constants to be used in the formulae for their design. 4000 w. Engng—Nov. 13, 1908. No. 447 A.

The Crushing Strength of Concrete-Filled Steel Columns (Die Knickfestigkeit betongefüllter Mannesmann-Stahlrohrsäulen). A. Gessner. Gives results of tests. 2100 w. Beton u Eisen—Oct. 26, 1908. No. 571 F.

Compressive Strength of Concrete Filled Iron Columns (Zur Beurteilung der Knickfestigkeit betongefüllter Eisen-säulen). Joh. E. Brik. Mathematical discussion of its computation. Ills. 3500 w. Oest Wochenschr f d Oeffent Baudienst—April 3, 1909. No. 4893 D.

See also Concrete, and Reinforced Concrete, under MATERIALS OF CONSTRUCTION.

Concrete.

Concrete—Its Aggregates and Mixing. William Challoner. Deals with conditions inseparable from the actual work, limiting the discussion to coarser component parts of concrete. General discussion. 8500 w. Surveyor—April 2, 1909. No. 3900 A.

Practical Methods of Concrete Construction. C. G. Cline. Brief account of things needing care in concrete construction. 2000 w. Ap Sci—March, 1909. No. 4093 C.

Hints for Inspectors of Concrete Work. The first of a series of articles discussing the more important duties of inspectors. 1800 w. Engng-Con—March 31, 1909. Serial, 1st part. No. 3680.

Mixing and Placing Concrete by Hand. Percy H. Wilson. Bulletin No. 20, Assn. of Am. Portland Cement Mfrs., issued to give practical instruction concerning concrete. Ills. 6000 w. Cement—Feb., 1909. No. 3002 C.

The Relation of Temperature to the Removal of Concrete Forms. Editorial on

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the need of tests to establish some scientific basis for form removal. 900 w. Eng News—Dec. 3, 1908. No. 774.

Cost of Concrete Work in the U. S. Reclamation Service. Henry A. Young. Refers to work on tunnel No. 3 of the Huntley Project, Montana. 1200 w. Cornell Civ Engr—March, 1909. No. 3199 C.

The Bonding of New to Old Concrete. E. P. Goodrich. Reviews the experimental work in this field, and gives an account of investigations made by the author. Ills. 8500 w. Pro Am Soc of Civ Engrs—Jan., 1909. No. 2123 E.

Concrete Construction in Water Works. William Curtis Mabee. From a paper before the Ind. Engng. Soc. Remarks on its peculiarities and the importance of intelligent supervision. 1500 w. Munic Engng—Feb., 1909. No. 2337 C.

Concrete in Water Works Construction. William Curtis Mabee. Principally an illustrated detailed description of the purification system of the Indianapolis Water Co. 4500 w. Am W-Wks Assn—June, 1909. No. 5922 N.

The Wet and Dry Mixtures of Concrete. M. H. Landis. Things to be considered in the manufacture of concrete building blocks, and other concrete construction. 1200 w. Cement—Aug., 1909. No. 7570 C.

A Concrete Mixing and Handling Plant for Constructing a Dam, With Some Details of Cofferdam Work. Illustrates and describes the plant used in constructing a dam across the Connecticut River, at Bellows Falls, Vt. 1200 w. Engng-Con—June 23, 1909. No. 6018.

The Floating Concrete Plant Used on the Detroit River Tunnel. Newton C. Farr. Describes the plant for placing concrete around the tubes sunk in the river to form a tunnel for the Mich. Cent. R. R. Ills. 1200 w. Cornell Civ Engr—March, 1909. No. 3200 C.

Uses of Concrete on a Country Estate. Linn White. An illustrated article showing its architectural possibilities. 4000 w. Sci Am Sup—Dec. 26, 1908. No. 1296.

Methods of Constructing Concrete Vaults for Valves. Carroll Beale. Illustrates and describes economical method of construction. 800 w. Engng-Con—Nov. 18, 1908. No. 372.

The Design and Construction of Forms for Concrete Work. A series of articles presenting approved methods and criticizing bad examples. Ills. 1800 w. Engng-Con—Sept. 22, 1909. Serial. 1st part. No. 8008.

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Contractor's Plants

Recent Examples of Concrete Construction. J. F. Springer. Illustrates and describes recent work, showing the progress in the use of plain and reinforced-concrete. 3500 w. *Cassiers' Mag*—July, 1909. No. 6349 B.

Method of Finishing Concrete Surfaces by Scrubbing Followed by an Acid Wash, With an Estimate of Cost. Views and description with cost analysis. 1500 w. *Engng-Con*—Jan. 6, 1909. No. 1588.

Artistic and Commercially Practical Surface Finishes for Concrete Work. J. H. Chubb. Illustrated article showing what can be accomplished in the way of producing pleasing surface finishes for concrete work. 2200 w. *Eng Rec*—April 3, 1909. No. 3708.

Casting the Concrete Lions for Connecticut Ave. Bridge, Washington, D. C. Gives a view of one of the finished lions, and describes the methods used in casting. 1500 w. *Eng News*—Nov. 19, 1908. No. 374.

Concrete Construction for Gun Battery. Illustrated detailed description of work. 2500 w. *Cement*—March, 1909. No. 3925 C.

A Concrete House. Illustrated description of a house at Doylestown, Pa. 2000 w. *Cement Age*—May, 1909. Serial. 1st part. No. 4753 C.

The Design and Construction of a Concrete House. John Wynkoop. The first of a series of articles giving sketch plans, elevations, perspective and working drawings and details for the design and construction. 2000 w. *Cement Age*—May, 1909. Serial. 1st part. No. 4752 C.

A Concrete Industrial Village. Frederic F. Lincoln. Illustrates and describes buildings at Mineville, N. Y. 1500 w. *Cement Age*—Sept., 1909. No. 7809.

See also Contractor's Plants, Contracts, Fence Posts, Foundations, Regulation, and Tunnels, under CONSTRUCTION; Pavements and Sidewalks, under MUNICIPAL; Wharves, under WATERWAYS and HARBORS; Conduits, under ELECTRICAL ENGINEERING, TRANSMISSION; and Shafts, under MINING AND METALLURGY, MINING.

Concrete Blocks.

The Cost of Cement Block Walls Compared with the Cost of Brick Walls. J. A. Smith. A collection of cost data and a comparative statement. 2500 w. *Engng-Con*—Feb. 3, 1909. No. 2295.

The "Eternit" Artificial Stone (La Pietra "Eternit"). Their constituents,

making and use are described. Ills. 3500 w. *Il Cemento*—Nov., 1908. No. 1936 D.

See also Fireproof, and Stacks, under CONSTRUCTION; and Sewers, under MUNICIPAL.

Concrete Tiles.

The Pauly Concrete Hollow Tile. Information concerning the manufacture and use of this material Ills. 900 w. *Cement Age*—Feb., 1909. No. 2729.

Contractor's Plants.

The Contractor's Plant for Building a Triple Barrel Reinforced Concrete Sewer. Illustrates and describes the plant for building a reinforced concrete sewer on pile foundations, mostly over a marsh, in the Bronx, New York City. 2800 w. *Eng. Rec*—Nov. 28, 1908. No. 700.

ing. Illustrates and describes methods Construction Plant Employed on the New York Water Supply. H. Prime Kieffer. Illustrates and describes the extensive and costly plant installed to secure the highest quality and greatest possible rapidity of the work. 1500 w. *Munic Engng*—Aug., 1909. No. 7028 C.

A Concrete Plant for Rapid Building Construction. Illustrated detailed description of the plant for a concrete building at East Norwood, Ohio. 1500 w. *Engng-Con*—April 21, 1909. No. 4151.

The Construction Plant for Covering the Providence Filters. Illustrated detailed description of the work and of the plant for executing it. 4500 w. *Eng Rec*—June 19, 1909. No. 5621.

A Simple Plant for Building a Dam and Reservoir. Illustrates and describes a convenient and cheap construction system adopted at Russelville, Ark. 900 w. *Eng Rec*—July 10, 1909. No. 6253.

The Construction Plant for the Gatun Locks of the Panama Canal. Illustrates and describes the more important details and general layout of the plant for the handling of stone, sand and cement, the mixing and placing of the concrete, and the main power station. 3500 w. *Eng Rec*—July 17, 1909. No. 6396.

Construction Plants for the Pacific Locks of the Panama Canal. Illustrated description of the material handling plant at the Miraflores locks and the Pedro Miguel lock. 3000 w. *Eng Rec*—Sept. 25, 1909. No. 8063.

See also Reinforced Concrete, under BRIDGES; Sewers, under MUNICIPAL; and Dams, under WATER SUPPLY.

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Contracts

Contracts.

Maintenance and Defect Clauses. Considers clauses for the protection of employer and of contractor necessary in contracts. 1600 w. Engr, Lond—Jan. 22, 1909. Serial. 1st part. No. 2222 A.

Concrete Structures from the Viewpoint of the Contracting Specialist. DeWitt V. Moore. Deals with the modern use of concrete for construction. 5000 w. Cal Jour of Tech—Jan., 1909. No. 2711.

Cost Estimating.

Cost Estimating; A Discussion of Principles with Actual Estimates for Contract Work. Jean Bart Balcomb. 6500 w. Engng-Con—July 14, 1909. No. 6333.

Cost-Keeping.

Cost Keeping on Municipal Contract Work. De Witt V. Moore. Discusses the methods of cost keeping and the benefit. 2500 w. Munic Engng—Jan., 1909. No. 1738 C.

Accounting and Cost Methods for Contractors. Considers methods used by the writer, giving forms, and information. 2500 w. Engng-Con—Sept. 1, 1909. Serial. 1st part. No. 7519.

A System of Cost Keeping. Myron S. Falk. An explanation of the Accounting System. 1200 w. Pro Am Soc of Civ Engrs—March, 1909. No. 3497 E.

A System of Cost Keeping. Discussion of Myron S. Falk's paper. 3000 w. Pro Am Soc of Civ Engrs—May, 1909. No. 5110 E.

The Cost-Keeping System of the United States Reclamation Service. Describes methods of giving a uniform system so that projects can be compared where conditions are similar, especially adapted to government work. 3500 w. Eng Rec—July 10, 1909. No. 6256.

Cost-Keeping on Concrete Construction on the C. B. & Q. Don E. Mowry. Brief explanation of method used. 900 w. R R Age Gaz—Jan. 15, 1909. No. 1794.

A Cost Record System Used for Work Done by Day Labor. Describes a special cost account system devised by C. S. Keating for work in Grand Rapids, Mich. 1800 w. Eng News—April 8, 1909. No. 3853.

A System of Collecting Cost Data With Particular Reference to a Sewer Contract. Explains the system used by two associated companies at Indianapolis, Ind. 2000 w. Engng-Con—Jan. 13, 1909. No. 1784.

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Domes.

The Schwedler Dome, Loads and Stresses. A. P. Mills. A mathematical discussion of dead load and wind load stresses. Diagrams. 3500 w. Mich Tech—Feb., 1909. No. 4070 D.

Earth Filling.

Density and Draining Capacity of Artificial and Natural Mixtures of Sand and Gravel. E. C. Murphy. Presents certain principles determined in investigations made in the U. S. Geol. Surv. laboratory. 1000 w. Eng News—Sept. 23, 1909. No. 8020.

Earthquakes.

Construction in Earthquake Countries. William Herbert Hobbs. Considers the actions of shocks and types of quake-proof structures, the materials, designs and related matters. Ills. 6500 w. Engineering Magazine—Sept., 1909. No. 7417 B.

Construction to Withstand Earthquakes (Le Case che non crollano). A. Danusso. A discussion inspired by the recent disaster in Sicily. Ills. 6000 w. Il Cemento—Jan. 15, 1909. No. 2652 D.

Earthquakes (Les Tremblements de Terre). E. Lemaire. A discussion of construction to withstand earthquake shocks with reference to the disaster at Messina. Ills. Serial, 1st part. 7000 w. Génie Civil—March 6, 1909. No. 4233 D.

The Employment of Reinforced Concrete in Localities Subject to Earthquakes (Pensieri sull' Impiego del Cemento armato in Località soggette a terremoti). C. Caveglia. A general discussion of the applicability of this material to structures in earthquake countries. 3200 w. Ann d Soc d Ing e d Arch Ital—March 15, 1909. No. 4242 F.

Earthquake Construction in Reinforced Concrete (Costruzioni antisismiche in Cemento armato, resistenti ai più forti Terremoti). G. Marrucchi and A. Bruttini. A mathematical discussion of the design of concrete structures to withstand earthquake shocks. Ills. 4500 w. Ann d Soc d Ing e d Arch Ital—March, 1909. No. 4243 F.

Foundations to Withstand Earthquakes (La Fondazioni asismiche). M. Viscardini. Describes the system patented by the author. 3000 w. Monit Tech—March 30, 1909. No. 4290 D.

Earthquake Construction (Erdbebensichere Bauten). F. von Emperger. Discusses the principles of safe construction of various parts of buildings. Ills. Serial. 1st part. 3300 w. Beton u Eisen—April 23, 1909. No. 5051 F.

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Earthquakes

Construction for Regions Subject to Earthquake Shocks (Norme edilizie per e Paesi soggetti a Terremoti). A. Pacchioni, G. C. Baravelli and others. An exhaustive discussion of the subject. 37500 w. Ann d Soc d Ing e d Arch Ital—April 1 and 15, 1909. No. 4844, each F.

A Study of the Vibrations of the Earth's Crust Under Earthquake Shocks (Etude des Vibrations du Sol lors des Tremblements de Terre). M. J. Bergeron. A theoretical discussion. Ills. 6500 w. Mem Soc Ing Civ de France—March, 1909. No. 5703 G.

Earthquake Construction (Edilizia antisismica). Editorial discussion of various theories and suggestions. Ills. 3500 w. Il Cemento—May 15, 1909. No. 5745 D.

Construction for Earthquake Countries (La Construction en Pays de Tremblements de Terre). G. Espitallier. Discusses the applicability of timber, masonry, steel and concrete. Ills. 8000 w. Mem Soc Ing Civils de France—March, 1909. No. 5704 G.

A System of Architecture for Earthquake Countries (Système d'Architecture pour Sol agité ou mouvant). F. J. Pillet. Illustrates and describes a system of construction secure against earthquake shocks. 2300 w. Mem Soc Ing Civils de France—March, 1909. No. 5706 G.

Reinforced Concrete and Earthquakes (Le Béton armé et les Tremblements de Terre). G. Flament-Hennebique. A discussion of its use in structures in earthquake countries. 4000 w. Mem Soc Ing Civils de France—March, 1909. No. 5705 G.

Regulations of the Italian Government for the Construction and Repair of Buildings in Earthquake Districts. The text of the decree of April 18, 1909. Ills. 18000 w. Ing Ferro—May 8, 1909. No. 5746 D.

Construction in Countries Subject to Earthquake Shocks (La Construction dans les Pays sujets aux Tremblements de Terre). E. Lemaire. The report of the Italian commission appointed to consider the best type of construction is reviewed. Ills. 4800 w. Génie Civil—July 17, 1909. No. 7232 D.

Building Regulations for the Italian Earthquake Regions (Norme Edilizie per le Regioni Italiane Colpite da Terremoti del 28 Dicembre 1908 od Anteriori). Editorial discussion of the report of the commission appointed to study this problem. 6000 w. Il Cemento—July 15, 1909. No. 7243 D.

Report of the Sub-Commission Appointed to Visit the Earthquake District

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in Calabria and Sicily (Relazione della Sottocommissione Incaricata di Visitare le Località Colpite dal Terremoto Calabro-Siculo del 1908). Text of the report presented to the Italian Government. Ills. 3500 w. Ing Ferro—July 1, 1900. No. 7245 D.

Construction Against Earthquakes (Le Costruzioni antisismiche). A. Danusso. First prize paper presented in a recent competition in Italy. Ills. 8000 w. Il Cemento—Aug. 30, 1909. No. 7943 D.

For Calabria and Sicily (Pro Calabria e Sicilia). Vittoria Gianfranceschi and Giulio Revere. Second prize paper in a recent competition on earthquake construction in Italy. Ills. 2500 w. Monit Tech—Aug. 20, 1909. No. 7944 D.

Report of the Jury in the Competition on Earthquake Construction Recently Held in Italy (Relazione della Giuria del Concorso per Costruzioni edilizie nelle Regioni Italiane soggette a Movimenti sismici). Serial. 1st part. 4000 w. Monit Tech—Sept. 20, 1909. No. 8638 D.

See also same title under BRIDGES, and MISCELLANY.

Earthwork.

Earthworks. On the importance of earthworks and their proper treatment, especially in railway construction; the angle of slope, material, etc. 1500 w. Engr, Lond—March 12, 1909. No. 3427 A.

Notes on Shrinkage of Earthwork and on Steam Shovel Work. F. Pardoe Wilson. Part of a paper before the Can. Soc. of Civ. Engrs. Discusses methods of applying shrinkage in embankment work. 600 w. Eng News—Aug. 12, 1909. No. 7053.

See also same title, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS.

Excavation.

Comments on Handling Earth with Wheelbarrows. Discusses their economic limitations. 1200 w. Engng-Con—Dec. 30, 1908. No. 1253.

Comments on the Use of Wagons in Transporting Earth. Considers different styles of wagons and methods of loading them. 3000 w. Engng-Con—Feb. 3, 1909. Serial. 1st part. No. 2206.

Machinery for Canal and Ditch Excavation. Editorial on recent developments in this class of machinery and the possibilities. 2500 w. Eng News—Aug. 26, 1909. No. 7359.

Hammer Drills Applied to Rock Excavation in Sewer Construction at Bloomington, Ind. George L. Thon. An illus-

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trated account of the work. 2200 w. Eng News—Sept. 9, 1909. No. 7625.

Methods and Costs of Rock Excavation and Washing Gravel for a Concrete Dam. William C. Steele. Describes work in connection with the building of a hollow concrete-steel dam on the Big Horn River, Wyoming. 800 w. Engng-Con—Jan. 6, 1909. No. 1589.

Handling the Excavation and Concrete Materials for a Large Steel-Cage Build-used in the most congested district of Chicago. 2800 w. Eng Rec—Nov. 28, 1908. No. 693.

An Important Legal Decision Regarding Trench Excavation. Editorial on the decision given by the U. S. Circuit Court of Appeals in the case of Gammino v. Town of Dedham. 1200 w. Eng Rec—Jan. 2, 1909. No. 1418.

Plowing as a Means of Classifying Excavation. Gives the opinion of the Indiana Supreme Court on this subject as rendered in a recent case. 4000 w. Eng Rec—April 10, 1909. No. 3860.

See also Barge Canal, and Rock Removal, under WATERWAYS AND HARBORS; Air Compressors, under MECHANICAL ENGINEERING, POWER AND TRANSMISSION; and Drills, under MINING AND METALLURGY, MINING.

Excavators.

The Van Buren Excavator. Illustrates and describes a machine for digging trenches, canals and railroad cuts. 1500 w. Ir Age—Oct. 7, 1909. No. 8373.

Factories.

The Design and Construction of Industrial Buildings. Herbert F. Stimpson. The first of three lectures before the senior class in mechanical engineering at Columbia University, N. Y. 6000 w. Eng Rec—May 29, 1909. Serial. 1st part. No. 5149.

Reinforced Concrete Construction in Industrial Plants. David Maxwell. Discusses the systems available 2500 w. Ind Engng—June, 1909. No. 5801 C.

Reinforced Concrete Industrial Buildings. J. P. H. Perry. Discusses questions in regard to the use of this material for manufacturing plants. 3500 w. Cement—May, 1909. No. 5557 C.

Materials and Methods of Construction for Industrial Buildings. J. P. H. Perry. Compares the qualities and costs of reinforced-concrete and mill construction. 4500 w. Engineering Magazine—Aug., 1909. No. 6753 B.

Reinforced Concrete for Factory Construction. J. P. H. Perry. Address be-

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Fireproof

fore the Machine Tool Builders' Association, showing the value of this material for such plants. Ills. 4000 w. Ir Age—Oct. 21, 1909. No. 8779.

A New Building for the Western Electric Company. Illustrated description of a fireproof factory building in Chicago, having 500,000 sq ft. of available floor space, to be used for the manufacture of telephone apparatus. 2500 w. Eng Rec—Feb. 27, 1909. No. 2853.

Failures.

Failures in Engineering Constructions. Dr. Charles B. Dudley. From the presidential address to the Am. Soc. of Test. Mat., June 29, 1909. A discussion of the causes and the question of responsibility. 4000 w. Ir Age—July 1, 1909. No. 6061.

Failure of a Reinforced-Concrete Floor of Unusual Design. H. Alexis d'O. Saurbrey. An account of the failure of a new manufacturing plant in Cleveland, Ohio, and the repair work. Ills. 1300 w. Eng News—Nov. 5, 1908. No. 99.

The Failure Under Test Load of a Reinforced-Concrete Reservoir, Annapolis, Md. R. A. Danforth. Describes the construction and the failure. Ills. 1000 w. Eng News—Jan. 14, 1909. No. 1787.

Failure of a Reinforced Concrete Reservoir at Annapolis. R. A. Danforth. A detailed description of the construction, the failure, and repair. Ills. 2200 w. Eng Rec—March 13, 1909. No. 3107.

See also Tanks, under WATER SUPPLY.

Fence Posts.

Cement and Concrete Fence Posts. H. M. Bainer. H. B. Bonebright. Shows how to make the posts, the best forms, mixtures, reinforcements, wire fasteners, cost and general practicability. Ills. 9500 w. Colo Agri Col. Bul. 148—June, 1909. No. 8032 N.

Fences.

See Retaining Walls, under CONSTRUCTION.

Fertilizer Plants.

Fertilizer and Acid Plants. F. E. Mac Knight. A brief résumé of the history and statistics of this industry, discussing the constructional features of the plants with special reference to the fire hazards. Ills. 3500 w. Ins Engng—March, 1909. Serial. 1st part. No. 3499 C.

Fireproof.

Modern Fireproof Construction. Facts and Figures. W. N. Moorhouse. Discussion and comparison of types of construction for warehouses or factory build-

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ings. Ills. and discussion. 6000 w. Can Soc of Civ Engrs, Bul. 5—May, 1909. No. 5852 N.

Fire-Resistant Construction of Buildings. An informal discussion at the annual convention, July 8, 1909. 6500 w. Pro Am Soc of Civ Engrs—Sept., 1909. No. 8188 E.

Fire Tests of Concrete and Terra Cotta Tile. A comparison of the fireproof properties of the two materials as disclosed by recent fires. Ills. 3300 w. Cement Age—Dec. 1908. No. 1318.

Status of Reinforced Concrete from the Fireproof Standpoint. Emile G. Perrot. On the behavior, economy and efficiency of concrete, its proper construction, etc. Ills. 1800 w. Cement Age. Dec., 1908. No. 1319.

Unburnable Homes, Their Artistic and Architectural Possibilities. Benjamin A. Howes. Discusses especially the use of reinforced concrete for residences. 3000 w. Cement—Jan., 1909. No. 2726 C.

Fireproof Stucco Construction. Mentor Wetzstein. Discusses concrete block stucco houses as fire resistant material, giving illustrations showing the artistic possibilities. 1000 w. Cement Age—Feb., 1909. No. 2728.

Fireproof Theatre Construction (Feuersicherheit der Theater). Refers especially to the new German regulations covering the construction of theatres, assembly rooms, and such buildings. Ills. Serial. 1st part. 3700 w. Gesundheits-Ing—Sept. 4, 1909. No. 8686 D.

Fire-Resisting Construction at the New Temporary Crib for the 73d St. Water Tunnel at Chicago. Illustrated detailed description. 900 w. Eng News—June 17, 1909. No. 5578.

Milford Paper Mills, Warren Manufacturing Company. Illustrated description of methods of construction used for a fireproof mill in New Jersey. 1500 w. Eng Rec—July 31, 1909. No. 6795.

The New School Buildings of Cincinnati. W. P. Anderson. Describes in detail the efforts to make fireproof the recent public school buildings, and the new features introduced. 1000 w. Eng Rec—Aug. 7, 1909. No. 6951.

Practical Fire Test of a Reinforced Concrete Factory. Illustrates and describes the condition of a factory in Philadelphia after passing through an intensely hot fire. 800 w. Cement Age—Aug., 1909. No. 7122.

See also Grain Elevators, and Reinforced Concrete, under CONSTRUCTION; Concrete, Fireproofing and Reinforced

Concrete, under MATERIALS OF CONSTRUCTION; and Clay-Products Testing, under MEASUREMENT.

Floors.

Concrete Floor Construction. Illustrated description of a modern method of treating concrete as lumber—the Vaughan System of portable concrete joists. 1500 w. Cement Age—Dec., 1908. No. 1320.

Costs of Constructing Combination Concrete and Tile Floors in Three Buildings. Figures given by Prof. W. K. Hatt. 1000 w. Engng-Con—Oct. 13, 1909. No. 8552.

A New Type of Reinforced-Concrete Floor. Alfred Gradenwitz. Illustrated description of the Pohlmann system. 1300 w. Cement Age—Oct., 1909. No. 8754.

Suspended Reinforced-Concrete Floors in the Grand Hôtel Royal, Lausanne (Planchers suspendus en Béton armé au Grand Hôtel Royal, a Lausanne). A. Paris. Illustrated description of their design and construction. 1400 w. Bul Tech d l Suisse Romande—Nov. 10, 1908. No. 1117 D.

See also Failures, under CONSTRUCTION; and Concrete, under MATERIALS OF CONSTRUCTION.

Foundations.

Foundations and the Use of Concrete. Geo. W. Martin. Discusses concrete foundations for walls and engines. Ills. 2900 w. Elec Age—May, 1909. No. 5431.

Machinery Foundations. Hints on foundations for machinery, and for structures such as bins, bunkers, hoppers, etc. 2000 w. Mech Wld—Jan. 22, 1909. No. 2214 A.

New Methods of Building Foundations in the United States (Nouvelles Méthodes employées aux Etats-Unis pour la Fondation des Bâtiments). Edmond Henry. Describes recent practice from the point of view of a French engineer. Ills. Serial, 1st part. 4000 w. Génie Civil—June 5, 1909. No. 6546 D.

Foundations on a Solid Mass of Concrete Set in Bottomless Caissons on a Riprap Bed in a Swift Current (Fondations sur Massif de Béton immergé dans des Caissons sans Fond reposant sur un Lit d'Enrochements dans un Courant rapide). M. Armand. Describes method of constructing foundations for harbor works. Ills. 2000 w. Ann d Ponts et Chaussées—1908-III. No. 506 E + F.

The Design of Continuous Foundations in Reinforced Concrete (Contributo al Calcolo delle Fondazioni continue in Cemento armato). A. Danusso. Mathemat-

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ical and theoretical. Ills. Serial, 1st part. 4500 w. *Il Cemento*—Feb. 15, 1909. No. 4245 D.

The Calculation of Pile Foundations (Zur Berechnung von Pfahlrostgründungen). E. Jacoby. A mathematical discussion of load distribution, etc. Ills. 2000 w. *Oest Wochenschr f d Oeffent Baudienst*—May 29, 1909. No. 5795 D.

A Test Loading of the Strauss Concrete Pile Foundation (Eine Probelastung mit dem Betonpfahl-Gründungssystem "Strauss"). Otto Colberg. Describes the system and the tests and gives results. Ills. 2000 w. *Beton u Eisen*—Feb. 23, 1909. No. 7552 F.

Foundations for the New Singer Building, New York City. T. Kennard Thomson. An illustrated detailed description of the construction of the pneumatic caisson foundations for this very tall building. 3500 w. *Pro Am Soc of Civ Engrs*—Oct., 1908. No. 488 E.

Foundations for the New Singer Building, New York City. Discussion of the paper by T. Kennard Thomson. Ills. 2000 w. *Pro Am Soc of Civ Engrs*—Dec., 1908. No. 1356 E.

Substructure of Farmers' Loan & Trust Company's Building, New York. Illustrates and describes interesting details to meet conditions, and in the treatment of adjacent buildings. 2500 w. *Eng Rec*—Oct. 31, 1908. No. 19.

Foundations for Addition to Manhattan Life Building, New York City. T. Kennard Thomson. Illustrated description of methods used on a difficult site. 6000 w. *Can Soc of Civ Engrs*—March 11, 1909. No. 4319 N.

The Reinforced Concrete Foundation of the New York and Richmond Gas Company's New Gasholder at Clifton, Staten Island. R. P. Raynesford. Illustrated description. 900 w. *Am Gas Lgt Jour*—May 3, 1909. No. 4387.

Foundation for the Building for the U. S. Naval Experiment Station at Annapolis, Md. Harrison W. Latta. Describes the conditions and the methods used in constructing pile foundations and fill. 3000 w. *Pro Engr's Club of Phila*—Jan., 1909. No. 6360 D.

Renewing Foundation of a Water Tank. William Martin. Describes work at Pittsburgh where a timber foundation was replaced by concrete. Discussion. 4000 w. *Pro Engrs' Soc of W Penn*—Oct., 1908. No. 349 D.

Foundations of the Northwestern Railway Terminal, Chicago. Describes work on caisson foundations under unfavorable

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soil conditions. 3000 w. *Eng. Rec*—May 8, 1909. No. 4572.

The Foundations for the New City Hall in Chicago. Illustrated description of the methods of construction used in the foundation work of a 12-story building on unstable soil. 2000 w. *Eng Rec*—June 12, 1909. No. 5486.

Foundations for the New Building and Pumps, Lake View Pumping Station, Chicago. A detailed description of the construction work. Ill. 4000 w. *Eng Rec*—Feb. 13, 1909. No. 2448.

Foundations of the Goldfield Consolidated Mill. Percy E. Barbour. Illustrates and describes a notable example of concrete foundations for mill construction. 1500 w. *Eng & Min Jour*—June 12, 1909. No. 5473.

Substructure of the New Meier & Frank Building. Gives details of a ten-story steel frame building, not including a basement, under construction in Portland, Ore., describing especially the waterproofing, underpinning, and other work of interest. Ills. 1800 w. *Eng Rec*—Aug. 7, 1909. No. 6947.

Application of Reinforced Concrete Piling in Foundations, Station "C," Oakland, Cal., of the Pacific Gas and Electric Company. H. C. Vensano, in *Pacific Gas and Electric Mag.* Illustrated description of foundation work using concrete piles with concrete caps. 2200 w. *Am Gas Lgt Jour*—Aug. 9, 1909. No. 6932.

Foundations for the New Courthouse in Düsseldorf (Künstliche Fundierung des Geschäftsgebäudes für das Oberlandesgericht zu Düsseldorf). Franz Boerner. The first part deals with the examination of the ground. The foundation was of reinforced-concrete. Serial. 1st part. 2700 w. *Beton u Eisen*—Oct. 26, 1908. No. 573 F.

The Settlement of the Magistrates' Courts, Georgetown, British Guiana. Leonard Percival Hodge. Describes a case where a building was allowed to settle under constant observation. Ills. 1200 w. *Inst of Civ Engrs*—No. 3735. No. 2793 N.

See also Excavation, Earthquake, Piling, and Underpinning, under CONSTRUCTION.

Frame Buildings.

Methods and Cost of Constructing Frame Cottages and Service Buildings for the Camaguey, Cuba, Waterworks. Henry A. Young. Describes buildings and gives details of costs. 3000 w. *Engng-Con*—April 14, 1909. No. 3976.

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Framed Structures

Framed Structures.

The Theory of Rigid Frames (Beitrag zur Theorie des steifen Rahmens). Emil Morgenstern. Mathematical. Ills. 3000 w. Beton u Eisen—April 2, 1909. No. 4898 F.

Gas Holders.

A Large Reinforced-Concrete Gas Holder (Grande Vasca Gasometrica in Cemento Armato). Illustrated description. 2000 w. Il Cemento—July 31, 1909. No. 7244 D.

See also Foundations, under CONSTRUCTION.

Grain Elevators.

Grain Handling in the United States. Sam'l O. Dunn. First instalment of a series discussing grain storage and transportation, including country and terminal elevators. 2200 w. R R Age Gaz—June 4, 1909. No. 5290.

Grain Elevator Construction. A. C. Olds. Read before the Fire Underwriters Assn. of the N. W. On the economy of fireproof elevators. Ills. 2500 w. Ins Engng—Oct., 1909. No. 8962 C.

The Concrete Grain Elevator of the Pennsylvania Railroad at Baltimore. Illustrated description of an interesting concrete structure, and of the system of belt conveyors for handling the grain. 2000 w. Eng Rec—Feb. 20, 1909. No. 2561.

The Mt. Clare Grain Elevator, Baltimore. Illustrated description of a reinforced-concrete elevator divided into small bins which are leased. 2500 w. Eng Rec—July 3, 1909. No. 6172.

A Large Reinforced-Concrete Grain Warehouse in Duluth. Illustrates and describes a warehouse of the circular-bin type being built for the Great Northern Ry. Co., at Superior, Wis. 2500 w. Eng Rec—Aug. 28, 1909. No. 7384.

Grain Elevators (Etude sur les Magasins à Grains). M. Barbet. A general discussion of their design and equipment and a detailed description of the elevator at the port of Rosario. Ills. Serial. 1st part. 7500 w. Rev de Mécan—Oct., 1908. No. 520 E + F.

Grain Elevators at Tempelhof on the Teltow Canal (Magasin à Grains de Tempelhof, près Berlin, sur le Canal de Teltow). A. Bidault des Chaumes. Illustrated description. Plate. 2400 w. Génie Civil—Dec. 12, 1908. No. 1928 D.

Graphical Statics.

The Deflection Polygon of a Framed Structure as a Funicular Polygon. Myron

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Piling

S. Falk. Mathematical. 800 w. Sch of Mines Qr—Nov., 1908. No. 973 D.

Grouting.

The Injection of Cement Grout Into Masonry (Note sur les Injections de Coulis de Ciment dans les Maçonneries). M. Luquet. Describes the apparatus used, composition of grout, and cost of injection, in the practice of the Metropolitan of Paris. Ills. 2200 w. Ann d Ponts et Chaussées—1909-IV. No. 7910 E + F.

High Buildings.

The Skyscraper and the Street. David Knickerbacker Boyd. Discusses the present phases of the question and proposes a scheme for correcting most of the difficulties. Ills. 3000 w. Am Archt—Nov. 18, 1908. No. 358.

Tall Buildings of New York. Illustrations and information concerning some of the lofty office buildings recently erected. 2500 w. Sci Am—Dec. 5, 1908. No. 814.

High Work.

Methods of Executing Light Work at Great Heights. Describes methods used in painting a cornice on a 14-story hotel in Philadelphia; of repairing tall stacks, etc. Ills. 3000 w. Eng Rec—Oct. 23, 1909. No. 8704.

Hydraulic Filling.

Hydraulic Filling in Mining and Construction on Land and in Water (Das Spülverfahren im Berg-, Erd- und Wasserbau). Jul. Fiedler. Illustrated outline of various applications. 3300 w. Oest Wochenschr f d Oeffent Baudienst—June 12, 1909. No. 6599 D.

See also Dams, under WATER SUPPLY.

Masonry.

Progress of Construction on the Cathedral of St. John the Divine. An illustrated description of recent work on this large cathedral under construction in New York City. 3000 w. Eng Rec—Jan. 23, 1909. No. 2019.

See also same title, under BRIDGES; and DAMS, under WATER SUPPLY.

Piles.

Bearing Power of Piles. M. C. Hendry. A discussion of this subject, giving opinions of experts. Ills. 6500 w. Can Engr—April 9, 1909. No. 3877.

See also Stations, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS.

Piling.

Discussion of Various Piles and Methods of Driving Them. Frederic W

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Swain. An illustrated discussion of modern and various types of concrete piles. 2500 w. Harvard Engng Jour—June, 1909. No. 5991 D.

Earth Displacement in Pile Driving (Versuche über die Verdrängung des Bodens beim Einrammen von Pfählen). J. Ritter von Schoen. A report of test results. Ills. 2000 w. Oest Wochenschr f d Oeffent Baudienst—May 8, 1909. No. 5791 D.

Practical Determination of the Permissible Load for Piles (Praktische Anwendungen der Methoden zur Bestimmung der zulässigen Pfahlbelastung). Richard Kafka. Refers principally to the staticgeometric method. Ills. Serial. 1st part. 2200 w. Beton u Eisen—May 15, 1909. No. 5786 F.

The Modern Steel Sheet Pile. J. F. Springer. History of the development and application of the earliest and modern types. 1500 w. Ir Trd Rev—Sept. 30, 1909. Serial. 1st part. No. 8225.

The Development and Use of Steel Sheet Piling, with Some Data on the Preservation of Steel Buried in the Ground. J. R. Wimplinger. Read before the Technical League, N. Y. City. 4000 w. Engng-Con—May 19, 1909. No. 4797.

Steel Sheeting and Sheet Piling. L. R. Gifford. A study of the essentials of a satisfactory steel piling and an analysis of some of the principal sections in use. Ills. 3000 w. Pro Am Soc of Civ Engrs—Feb., 1909. No. 3458 E.

The Wemlinger Steel Sheet Piling. An illustrated article giving information in regard to this piling and its use. 2500 w. Ir Age—Sept. 9, 1909. No. 7607.

Concrete Piles. Howard J. Cole. Presents the advantages of the various types, describing the methods of driving and giving data of bearing power, cost, etc. Ills. 8500 w. Pro Am Soc of Civ Engrs—May 1, 1909. No. 5105 E.

Concrete Piles. Discussion of paper by Howard J. Cole. 5000 w. Pro Am Soc of Civ Engrs—Sept., 1909. No. 8191 E.

Concrete Piles. J. F. Springer. The present article deals with foundation construction upon corrugated and molded piles. Ills. 3500 w. Cassier's Mag—Sept., 1909. Serial. 1st part. No. 7779 B.

Large Concrete Piles. William F. Johnston. Illustrated description of piles built in the ground, used in Europe. 1500 w. Eng Rec—Sept. 25, 1909. No. 8071.

Straight or Tapered Concrete Piles? Clarence S. Howell. Describes methods of manufacture, and gives a comparison between straight and tapered piles as to

load capacity. 1600 w. Eng News—Feb. 25, 1909. No. 2761.

Shop-Made Reinforced-Concrete Piles. L. J. Mensch. Illustrates and describes work carried out at Oakland, Cal. 1200 w. Eng News—Dec. 3, 1908. No. 775.

Cast Reinforced Concrete Piles. Sanford E. Thompson and Benjamin Fox. Gives description of the design, construction and data on driving cast reinforced concrete piles for a foundation of the Boston Woven Hose and Rubber Co.'s new power plant in Cambridge, Mass. Ills. Discussion. 7000 w. Jour Assn of Engng Socs—Jan., 1909. No. 3223 C.

Concrete Piles Used in the Steamship Terminals at Brunswick, Ga., and in Navy Yard Pier at Charleston, S. C. M. M. Cannon. A description of the pile work. Ills. Discussion. 4500 w. Jour Assn of Engng Socs—Jan., 1909. No. 3224 C.

Build-Up Concrete Slab Piles and Pile Protection. Illustrates and describes a form of pile used in England, which allows renewals to be made without interfering with the use of the structure. 2000 w. Eng Rec—May 8, 1909. No. 4573.

A Reinforced-Concrete Pile Foundation (Eine ausgeführte Gründung mit Beton-Blechrohr-Pfählen). Richard Kafka. Illustrated description of work with piles reinforced on a new system. 3000 w. Zeitschr d Oest Ing u Arch Ver—April 9, 1909. No. 4892 D.

The Best Form for Reinforced Concrete Piles (Ueber die günstigste Form der Betonpfähle). Richard Kafka. Discusses the shape of piles with reference to stability and ease of driving. Ills. 4000 w. Oest Wochenschr f d Oeffent Baudienst—Dec. 19, 1908. No. 1977 D.

Method of Constructing Reinforced Concrete Pile Bents for the Atlantic City Boardwalk. Illustrates and describes the structural details and construction methods. 2500 w. Engng-Con—Feb. 17, 1909. No. 2538.

Method of Making and Placing Pile Protection at Everett, Wash. Illustrated description of lock joint pipe protection. 2000 w. Eng Rec—Jan. 16, 1909. No. 1767.

The Creosoted Pile Bridge from Galveston Island to the Mainland. Describes the effect of sea water on the piles of the old bridge. 500 w. Eng News—Jan. 7, 1909. No. 1643.

See also Foundations, under BRIDGES; and Coffor Dams, and Dikes, under WATERWAYS AND HARBORS.

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Plates

Plates.

The Elastic Equilibrium of Thick Circular Plates (*Equilibre élastique des Plaques circulaires épaisses*). M. Mesnager. Mathematical discussion. 14000 w. *Ann d Ponts et Chaussées*—1909-IV. No. 7911 E + F.

Reclamation.

Reclamation and Development of the New Jersey Coast. George L. Watson. Describes this work at Five Mile Beach, especially methods of sewer and street construction. Ills. 2500 w. *Can Soc of Civ Engrs*—April 15, 1909. No. 4532 N.

The Reclamation of Wet Lands in Louisiana. Information relating to the improvement of land by levees and drainage, the methods used, etc. Ills. 2000 w. *Eng Rec*—Oct. 9, 1909. No. 8437.

Reclamation of the Florida Everglades. J. H. Reese. An account of the work already done, the plan of drainage, the cost, and the good to result from the reclamation. 3000 w. *Mfrs' Rec*—Oct. 7, 1909. No. 8385.

Building a City at Long Beach, Long Island. Illustrates and describes the work of converting 2000 acres of salt marsh, tidal channels and sand dunes into a fine residence city. 3000 w. *Eng Rec*—Nov. 21, 1908. No. 415.

The Reclamation of an Extension to Lincoln Park, Chicago. Outline of methods used. 2000 w. *Eng Rec*—Feb. 27, 1900. No. 2852.

The Reclamation of the Site for the Beach City of Naples, California. Explains conditions and the scheme of development of the site. Ills. 2000 w. *Eng Rec*—Feb. 6, 1909. No. 2311.

The Drainage and Reclamation of the Zuider Zee (*Het Wetsontwerp voor den Aanleg van een Gedeelte van de Afsluiting der Zuiderzee en indijking en droogmaking van de Wieringermeer*). Dr. J. Kraus. A comprehensive general review of the project. 7800 w. *De Ingenieur*—Feb. 20, 1909. No. 3575 D.

See also *Coast Protection, under WATERWAYS AND HARBORS.*

Record Systems.

Some of the Recording Systems of a Large Engineering Corporation. R. M. Henderson in the *Armour Engineer*. Explains methods of systemizing field work so as to enable the home office to keep constantly in touch with work everywhere. 2500 w. *Eng Rec*—Jan. 30, 1909. No. 2177.

The Filing System of the Elevated and Subway Construction Department, Boston

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Elevated Railway Company. Herbert C. Hartwell. Explains the working methods of the plan-filing system. 2000 w. *Eng Rec*—Feb. 6, 1909. No. 2306.

An Efficient Index System for City Engineers' Offices. William Gavin Taylor. Read before the Connecticut Soc. of Civ. Engrs. Remarks on various systems, with explanation of the filing system developed by the writer. 2200 w. *Eng Rec*—March 20, 1909. No. 3270.

See also *Filing Systems, under INDUSTRIAL ECONOMY.*

Regulations.

Regulations for the Planning, Execution and Testing of Concrete Structures. Gives the regulations adopted for Germany. 1500 w. *Cement*—March, 1900. No. 3923 C.

General Regulations for the Preparation, Execution and Testing of Rrammed Concrete Construction (*Allgemeine Bestimmungen für die Vorbereitung, Ausführung und Prüfung von Bauten aus Stampfbeton*). An abstract and a discussion of the regulations adopted by the German Reinforced Concrete Commission. 4000 w. *Beton u Eisen*—Nov. 20, 1908. No. 1177 F.

Draft of Regulations for Concrete Construction (*Concept-Betonijzer-voorschriften*). The text of the regulations proposed by the Dutch Institute of Engineers. 4800 w. *De Ingenieur*—March 20, 1909. No. 4375 D.

Reinforced Concrete.

Is Concrete Steel a Permanent Construction? J. A. Fitzpatrick. A brief account of an unusual example of deterioration of steel framing in buildings. 500 w. *Sci Am*—Nov. 28, 1908. No. 472.

Reinforced Concrete for Architectural Construction. Walter J. Francis. Read before the Ontario Assn. of Archts. Discussion of its history and principles. Ills. 4000 w. *Contract Rev*—Jan. 20, 1909. Serial, 1st part. No. 2014.

Some Practical Ideas on Reinforced Concrete Design. Ernest McCullough. A talk before the Civ. Engrg. Soc. of Armour Inst. on some things not mentioned in current treatise, such as deflection, factor of safety, etc. 5400 w. *Engng-Con*—April 14, 1909. No. 3973.

Evolution of Concrete Reinforcement. Harry Franklin Porter. Read before the Nat. Assn. of Cement Users. Considers the development of steel reinforcement. 3300 w. *Cement*—March, 1909. No. 3924 C.

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The Practical Side of Reinforced Concrete Building. Vere Sussex Hyde. Illustrates and describes details of construction of importance for safety. 2000 w. *Prac Engr*—April 9, 1909. Serial, 1st part. No. 3992 A.

The Artistic Treatment of Reinforced Concrete (Die künstlerische Lösung des Eisenbetonbaues). István Medgyaszay. A discussion of the artistic possibilities of the material, illustrated with examples of recent structures. Serial. 1st part. *Beton u Eisen*—April 23, 1909. No. 4899 F.

The Use of Ferro-Concrete in Monumental Architecture. Translated from a lecture given the Austrian Society of Engineers and Architects by Alexander Edler v. Monteforte. Ills. 2500 w. *Archit.* Lond—Sept. 17, 1909. Serial. 1st part. No. 8102 A.

Cost of Concrete Construction as Applied to Buildings. Leonard C. Wason. Read before the Nat. Assn. of Cement Users. Gives actual costs of various parts of building construction. 3500 w. *Eng Rec*—Jan. 16, 1909. No. 1770.

Unit Costs of Reinforced Concrete Building Construction. T. Herbert Files. Deals with labor costs only. 1200 w. *Engng-Con*—April 7, 1909. No. 3870.

The Examination of Designs for Reinforced Concrete Work. William Dunn. Abstract of a paper read before the Concrete Inst. Discusses designs, methods of calculation, importance of superintendence, etc. 2000 w. *Surveyor*—Dec. 25, 1908. No. 1515 A.

The Cost of Concrete Construction as Applied to Buildings. Leonard C. Wason. Gives actual costs of various parts of building construction. 2500 w. *Cement*—Jan., 1909. No. 2727 C.

The Spacing of Reinforcement in Concrete Beams (Eisenabstände in Plattenbalken). B. Löser. Mathematical. Ills 2100 w. *Beton u Eisen*—Oct. 26, 1908. No. 574 F.

The Principles and Resources of Reinforced Concrete Construction (Le Béton armé actuel, ses Principes et ses Ressources). Charles Rabut. A general review. 3000 w. *Ann d Ponts et Chauss*—1908-IV. No. 1313 E + F.

Continuous Beams with Elastic Column Connections (Kontinuierlicher Träger mit elastisch verbundenen Stützen). Mario Genel. Mathematical. Ills. 4500 w. *Beton u Eisen*—Oct. 9, 1908. No. 575 F.

A Note on the Design of Rectangular Slabs (Ein Beitrag zur Berechnung der rechteckigen Platten). Jovo Simic. A mathematical discussion of stress distri-

bution, etc. Ills. 4000 w. *Zeitschr d Oest Ing u Arch Ver*—Oct. 30, 1908. No. 583 D.

Surfaces of Greatest Shearing Stresses for Steel Reinforced in Concrete. M. Koenen, in *Beton u Eisen*. A discussion of the influence of shape, adhesive resistance, etc. 1000 w. *Cement*—Dec., 1908. No. 1732 C.

The Graphic Statics of Reinforced Concrete Sections. William Dunn. The treatment is based on Mohr's methods. Descriptive, with diagrams. 3500 w. *Engng*—Dec. 25, 1908. No. 1536 A.

Graphical Charts for the Determination of the Normal Stresses in Reinforced-Concrete Beams (Graphische Tafeln zur Bestimmung der Normalspannungen in Beton-Eisen-Trägern). J. Rieger. An exhaustive mathematical discussion of the construction and use of the charts. Ills. 70000 w. *Oest Wochenschr f d Oeffent Baudienst*—Dec. 12, 1908. No. 1976 D.

Diagrams for Reinforced Concrete Beams. H. O. Schermerhorn. Inset plate of diagrams, with explanation and review of the principles of design as far as is necessary to show the deduction of the equations. Illustrates their use. 2500 w. *Eng Rec*—March 6, 1909. No. 2974.

A Method of Designing Reinforced Concrete Beams (Note sur une Méthode de Calcul des Poutres en Ciment armé). M. Pigeaud. A mathematical demonstration. Ills. 9600 w. *Ann des Ponts et Chaussées*—1908-VI. No. 3312 E — F.

The Design of Continuous Beams and Slabs in Reinforced Concrete (Berechnung durchgehender Träger und Decken aus Eisenbeton). E. Elwitz. Mathematical. Ills. Serial, 1st part. 3800 w. *Beton u Eisen*—Dec. 14, 1908. No. 1986 F.

Calculation and Design of Rectangular Slabs Supported on All Four Sides (Beitrag zur Berechnung und Dimensionierung vierseitig aufgelagerter Platten). C. Abeles. Mathematical. Ills. Serial, 1st part. 2000 w. *Deutsche Bau*—July 17, 1909. No. 7280 B.

The Use of the Deflection Diagrams (Ueber die Verwertung des Durchbiegungsdiagramms). A. Kleinlogel. Discusses their application to the design of reinforced-concrete beams. Ills. Serial, 1st part. 1100 w. *Beton u Eisen*—Dec. 14, 1908. No. 1987 F.

Reinforced Concrete T-Beam Tables. J. Norman Jensen. Gives a table for determining the area of steel and width of reinforced concrete T-beams, explaining its preparation. 2000 w. *Eng Rec*—April 10, 1909. No. 3864.

Formulas for the Strength of Reinforced-Concrete Beams. Percy John

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Robinson. A discussion of formulae, developed on rational lines, by which the strength may be calculated. 3500 w. *Inst of Civ Engrs*—No. 3773. No. 2794 N

Simplified Methods of Calculating Reinforced Concrete Beams. W. Noble Twelvetees. Read before the Manchester Univ. Engng. Soc. A mathematical study, and a description of a calculating instrument devised by the author. 4000 w. *Surveyor*—Jan. 29, 1909. No. 2350 A.

A New Graphical Method for Calculating Beams of Varying Moment of Inertia and Fixed at Both Ends (Eine neue graphische Berechnungsmethode für beiderseits eingespannte Träger mit veränderlichem Trägheitsmoment). Rich. Wuczkowski. *Mathematical. Ills.* 2000 w. *Beton u Eisen*—Jan. 8, 1909. No. 2819 E.

Distribution of Stresses in Compound Bodies (Ueber die Spannungsverteilung in Verbundkörpern). Alfons Leon. A mathematical discussion illustrated by the case of reinforced concrete. *Ills. Serial.* 1st part. 4500 w. *Oest Wochenschr f d Oeffent Baudienst*—Jan. 9, 1909. No. 2816 D.

The Joining of Tension Reinforcement in Concrete Beams (Expériences sur les Jonctions de Barres tendues dans les Poutres en Béton armé). M. Mesnager. Results of extensive tests on overlapping and joining bars for reinforcement. *Ills.* 11000 w. *Ann d Ponts et Chauss*—1908—II. No. 2607 E + F.

Advance in Reinforced-Concrete Construction: An Argument for Multiple-Way Reinforcement in Floor Slabs. C. A. P. Turner. An illustrated article describing this system and the advantages claimed. 4500 w. *Eng News*—Feb. 18, 1909. No. 2522

Stresses due to Temperature Changes in Reinforced Concrete (Temperaturspannungen im Eisenbeton). Fritz v. Emperger. An examination of the magnitude of the stresses due to expansion and contraction. *Ills. Serial.* 1st part. 3000 w. *Zeitschr d Oest Ing u Arch Ver*—May 28, 1909. No. 5789 D.

An analysis of the Reinforced-Concrete A-Beam. Edward Godfrey. A criticism of the analytical methods commonly employed. 1200 w. *Ind Engng*—July 15, 1909. No. 6679 C.

Experience with Siegwart Beams (Ausführungen mit Siegwartbalken). F. Steiner. Describes and discusses mathematically the construction of the Olten electric station. *Ills.* 2700 w. *Beton u Eisen*—June 10, 1909. No. 6706 F.

The Design of Rectangular Slabs Sup-

ported on All Sides (Beitrag zur Berechnung der rechteckigen, ringsum aufliegenden Platten). Jovo Simic. *Mathematical. Ills.* 2500 w. *Oest Wochenschr f d Oeffent Baudienst*—June 5, 1909. No. 6598 D.

Stresses and Strains in Reinforced-Concrete Subjected to Simple or Compound Bending (Tensioni e Deformazioni reali nelle Strutture di Cemento armato soggette a Flessione semplice o composta). C. Parvopassu. *Mathematical. Ills. Serial.* 1st part. 4000 w. *Ann d Soc d Ing e d Arch Ital*—June 1, 1909. No. 6552 F.

Moments in Continuous Reinforced-Concrete Beams Under Uniform Loading. R. E. Spaulding. A mathematical analysis. 1500 w. *Eng News*—Sept. 30, 1909. No. 8204.

A Graphical Method for Determining the Stresses in, and Fixing the Dimensions of, Reinforced-Concrete Beams (Graphisches Verfahren zur Ermittlung der Spannungen und direkten Dimensionierung von Plattenbalken aus Beton-Eisen). Emil Heidecker. Detailed demonstration. *Ills.* 6500 w. *Oest Wochenschr f d Oeffent Baudienst*—Aug. 14, 1909. No. 7988 D.

Formulas for Designing Reinforced Concrete Beams. Melvin D. Casler. Gives formulas of different form from those commonly used, with diagram, and explanation. 1600 w. *Eng Rec*—Oct. 2, 1909. No. 8241.

Stresses in Reinforced-Concrete Beams. Prof. Gaetano Lanza and Lawrence S. Smith. Comparison of experimental results with results obtained from the application of three theories of distribution of stresses. 2000 w. *Jour Am Soc of Mech Engrs*—Mid-Oct., 1909. No. 8748 F.

Test Loading of a Pohlmann Roof to Determine the Accuracy of Certain Formulae for the Deflection of Reinforced Concrete Beams (Die Probebelastung einer Bulbeisendecke, System Regierungsbaumeister Pohlmann, nebst Untersuchung des Genauigkeitsgrades einiger für die Durchbiegung von Eisenbetonbalken angegebenen Formeln). *Ills.* 4000 w. *Beton u Eisen*—Sept. 24, 1909. No. 8698 F.

Reinforced Concrete Joists, with Hollow Tile Fillers. J. Norman Jensen. Describes a type of construction for a fire-proof floor adapted to wide spans. 2000 w. *Eng Rec*—Oct. 9, 1909. No. 8433.

The Employment of Reinforced Concrete Beams according to the Regulations of the Italian Government (Il Calcolo delle

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Travi inflesse in Cemento armato secondo le Normi Ministeriali Italiane). Mathematical. Ills. Serial. 1st part. 4000 w. Il Cemento—Oct., 1908. No. 1137 D.

Bending Moments in Continuous Reinforced Concrete Beam. A discussion by O. Gottschaer, in *Beton u. Eisen*, of the bending moments in a continuous beam over 3 supports, especially at the mid-support. 1000 w. Cement—Nov., 1908. No. 899 C.

The Manufacture, Erection and Demolition of Forms for Concrete Work. Francis W. Wilson. A criticism of method generally used for the manufacture and erection of form work with discussion of an improved system. 3000 w. Eng News—Dec. 17, 1908. No. 980.

A Novel System of Concrete Construction. Day Allen Willey. Illustrated description of methods of construction at Camp Perry, Ohio. 1400 w. Sci Am—Dec. 26, 1908. No. 1293.

The Employment of Reinforced Concrete in Public Works (*L'Emploi du Béton Armé dans les Travaux publics*). M. G. Espitalier. Reviews its many uses, in the construction of dams, breakwaters, foundations, piles, etc. Ills. 11000 w. Mem Soc Ing Civ de France—Oct., 1908. No. 1305 G.

The Advantages of Reinforced Concrete for Railway Construction. B. H. Davis. Considers the familiar uses of this material in railway construction, pointing out the advantages and disadvantages, and comparing costs with other materials. Ills. 4500 w. Cement—Jan., 1909. No. 2725 C.

The Applicability and Economy of Concrete and Reinforced Concrete for Subway Construction. Charles M. Mills. Abstract of paper read before the Nat. Assn. of Cement Users. Considers the important features and advantages. 2000 w. Engng-Con—Feb. 10, 1909. No. 2468.

Reinforced Concrete in Market Street Subway, Philadelphia. S. M. Swaab. A short illustrated description of the plant and construction methods used. 2000 w. Cement Age—Jan., 1909. No. 1733.

Modern Factory Construction in Reinforced Concrete (*Moderne Fabrikbauten in armiertem Beton*). Hugo Grözer. A brief general discussion with descriptions of some notable structures in Austria. Ills. Serial. 1st part. 4000 w. Zeitschr d Oest Ing u Arch Ver—Sept. 10, 1909. No. 8689 D.

Cold-Storage Warehouses of Reinforced Concrete Construction. J. P. H. Perry. Considers different methods of insulating buildings for cold storage and the adapt-

ability of reinforced concrete to this type of structure. Ills. 4500 w. Eng Rec—Jan. 30, 1909. No. 2180.

A Reinforced Concrete Interlocking Tower. Illustrates and describes a tower, designed for a 48 lever machine. 1000 w. Sig Engr—March, 1909. No. 3238.

Construction and Reconstruction. J. P. H. Perry. Illustrates and describes the model factories of the Bush Terminal Co., built of reinforced concrete on unimproved land; and also the reconstruction of the King plaster mill in the same material, while in operation. 2200 w. Ins Engng—May, 1909. No. 4990 C.

Reinforced Concrete House Built by an Entirely New Method. Describes a house built of steel tubing, wire, malleable fittings and concrete which shows radical departures from previous methods of fire-proof construction. Ills. 1200 w. Ind Wld—June 7, 1909. No. 5386.

Construction of the Baxter Building, Portland, Maine. Illustrated description of methods used for a reinforced concrete frame with flat-slab reinforced concrete floors and brick walls. 1300 w. Eng Rec—April 10, 1909. No. 3862.

The New Board Mill of the Androscoggin Pulp Company. Describes a new reinforced-concrete mill at South Windham, Maine, and its equipment. 2000 w. Eng Rec—Feb. 13, 1909. No. 2451.

Reinforced Concrete Construction in the Hartford Armory. States the requirements and conditions and describes the construction. Ills. 3000 w. Eng Rec—Jan. 9, 1909. No. 1575.

The Reconstruction in Reinforced Concrete of the Large Manufacturing Plant of J. B. King & Co., Staten Island, N. Y. Arthur G. Hoadley. Illustrated detailed description of interesting methods. 3500 w. Eng News—April 22, 1909. No. 4161.

Reinforced-Concrete Building of the Phelps Publishing Co., Springfield, Mass. Arthur C. Tozzer. The design and construction of a large 8-story building is illustrated and described. 2500 w. Eng News—Feb. 18, 1909. No. 2520.

Engine House with Separately Molded Roof Members. Illustrates and describes details of interest in the construction of an engine house at Waterbury, Conn. 2500 w. Eng Rec—July 10, 1909. No. 6252.

Reinforced-Concrete Buildings for a Large Manufacturing Plant. W. A. Hoyt. Illustrates and describes the new plant of the Corn Products Co., at Argo, Ill., near Chicago. 4000 w. Eng News—Aug. 26, 1909. No. 7356.

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The Loeser Warehouse. Illustrated description of a reinforced concrete structure in Brooklyn, N. Y., protected with approved apparatus for detecting and extinguishing fires. 1000 w. *Ins Engng*—Sept., 1909. No. 8499 C.

Arch for Supporting a Floor of the Christopher Warehouse, Jacksonville, Fla. Illustrates and describes a reinforced-concrete warehouse in which a portion of the flooring and roof are carried by arches having a clear span of 54 feet. 1500 w. *Eng Rec*—Jan. 16, 1909. No. 1768.

A Concrete Church, and the Methods of Waterproofing It. Illustrates and describes methods used in erecting the Church of Our Lady of Mercy in New York City. 2000 w. *Eng Rec*—Oct. 23, 1909. No. 8706.

The Cummins Station Warehouse, Nashville, Tennessee. A reinforced-concrete frame, floors and roof, with outside walls of brick. Ills. 2500 w. *Eng Rec*—April 24, 1909. No. 4171.

Reinforced Concrete Stock Pen Construction for the Union Stock Yards & Transit Co., Chicago, Ill. The present article gives details of the new platform and pen construction. Ills. 1500 w. *Engng Con*—Feb. 17, 1909. No. 2537.

A Ten-Story Reinforced Concrete Warehouse in Pittsburg. Brief illustrated description. 1600 w. *Eng Rec*—Feb. 6, 1909. No. 2304.

A Reinforced Concrete Theater and Office Building, Los Angeles, Cal. Describes the peculiar heavy construction of this building, giving plans. 2000 w. *Eng News*—Feb. 11, 1909. No. 2393.

The Majestic Theater Building at Los Angeles. Illustrated description of a combined office and theater structure built entirely of reinforced concrete. 3000 w. *Eng Rec*—Jan. 30, 1909. No. 2179.

A Large Reinforced-Concrete Dome on a Church in Los Angeles, Cal. Illustrations with brief description. 1000 w. *Eng News*—Sept. 2, 1909. No. 7532.

A Reinforced Concrete Church in Los Angeles, Cal. Illustrates and describes the methods of construction, especially the reinforcement of the dome and supporting columns. 1000 w. *Eng Rec*—March 20, 1909. No. 3267.

Reinforced Concrete Dome of the Porto Rico Capitol. Illustrated detailed description of this feature of the new capitol. 1500 w. *Eng Rec*—May 1, 1909. No. 4393.

Group of Reinforced-Concrete Build-

ings for a Wood Distillation Plant, Donald, Ont. Illustrates and describes a plant for the destructive distillation of wood into alcohol, with acetate of lime and charcoal as by-products. 2000 w. *Eng News*—Jan. 28, 1909. No. 2148.

A Notable Industrial Plant of Reinforced Concrete. Illustrates and describes the chemical mills of the Wood Products Co., at Donald, Ontario. 2500 w. *Cement Age*—Jan., 1909. No. 1734.

The Building and Equipment of the Keewatin Flour Mill. Illustrated description of a reinforced-concrete building in Ontario, its equipment and operation. 3000 w. *Eng Rec*—May 29, 1909. No. 5145.

The Mount Carmel Wing of the Chateau Frontenac, Quebec. H. P. Borden. Illustrated description of an extension increasing the capacity of this famous hotel 50 per cent. Reinforced-concrete construction is largely used. 3500 w. *Eng Rec*—July 24, 1909. No. 6648.

Bank of Nova Scotia, Kingston, Jamaica. Robert T. H. Sailman. Describes points of interest in the design and construction of a building aiming to be fireproof and secure against damage by earthquake. 3000 w. *Can Engr*—April 16, 1909. No. 3995.

The General Post-Office Extension. Illustrated detailed description of an important reinforced concrete construction in London. 2800 w. *Builder*—April 3, 1909. Serial, 1st part. No. 3886 A.

A Concrete Foundry Building in Germany. H. Prime Kieffer. Illustrated description of a simple, inexpensive and thoroughly fireproof reinforced-concrete structure. 1000 w. *Cement Age*—April, 1909. Serial, 1st part. No. 4081.

Reinforced-Concrete Construction in the Enlargement of the Oberlenningen Paper Mill (Die Eisenbetonkonstruktionen in den Erweiterungsbauten der Papierfabrik Oberlenningen, Württemberg). Illustrated description of heavy factory construction. 2800 w. *Beton u Eisen*—March 10, 1909. No. 4283 F.

Reinforced Concrete Construction in Hall III in the Munich Exhibition Park (Bau der Halle III in Eisenbetonkonstruktion auf dem Ausstellungspark Theresienhöhe in München). Fritz Klette. Illustrated description of a large building used for exhibition purposes. Plate. 2200 w. *Beton u Eisen*—Dec. 14, 1908. No. 1984 F.

Reinforced-Concrete Construction in the Extension of the Ludwig-Maximilian University, Munich (Die Eisenbeton-

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konstruktionen bei dem Erweiterungsbau der Kgl. Ludwig-Maximilians-Universität München). J. Bosch. Describes many interesting features. Ills. Serial, 1st part. 1000 w. Beton u Eisen—June 10, 1909. No. 6707 F.

Reinforced Concrete in the Zeppelin Air Ship Shed Competition (Der Eisenbeton im Wettbewerb um die Luftschiff-Bauhalle Zeppelins). Illustrates and describes designs for an immense arched structure. Serial, 1st part. 1800 w. Deutsche Bau—Feb. 6, 1909. No. 3382 B.

The Printing House of Oskar Brandstetter in Leipzig (Noten- und Buchdruckerei Oskar Brandstetter in Leipzig). Em. Haimovici. Illustrated description of interesting features. 2500 w. Beton u Eisen—April 2, 1909. No. 4896 F.

Car and Locomotive Shops of the Salzburg Railway and Tramway Company (Wagen- und Lokomotivschuppen der Salzburger Eisenbahn- und Tramway-Gesellschaft). Franz Böhm. Description of heavy shop construction in reinforced concrete. Ills. 2000 w. Beton u. Eisen—Sept. 1, 1909. No. 8697 F.

Reinforced Concrete Construction in the Basel Municipal Theatre (Die Eisenbetonkonstruktionen des Stadttheatres in Basel). Illustrations with brief description of the construction. Serial, 2 parts. 2000 w. Schweiz Bau—April 3 and 10, 1909. No. 4875, each B.

The New Theatre in Copenhagen (Das neue Theater in Kopenhagen). E. Suen-son. Illustrated description of interesting construction in reinforced concrete. 3300 w. Beton u Eisen—April 23, 1909. No. 5050 F.

The New Shanghai Telephone Exchange Building. C. Luthy. Illustrated description of an elaborate reinforced-concrete, six-story building recently completed. 1200 w. Eng Rec—Aug. 21, 1909. No. 7300.

Ferro-Concrete Submarine Dépôt at Haslar. Illustrates and describes a new dépôt for submarine vessels built on the Mouchel-Hennebique system. 1500 w. Engng—June 11, 1909. No. 5660 A.

See also same title, under BRIDGES; Coal Pockets, Contractor's Plants, Contracts, Earthquakes, Factories, Failures, Fireproof, Floors, Foundations, Gas Holders, Grain Elevators, Piling, Regulations, Retaining Walls, Roofs, Steel Underpinning, and Waterproofing, under CONSTRUCTION; Concrete and Reinforced Concrete, under MATERIALS OF CONSTRUCTION; Septic Tanks, Sewage Tanks, and Sewers, under MUNICIPAL; Dams, Pipes, Purification, Siphons, Tanks, Water

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Retaining Walls.

The Design of Retaining Walls. Information from the Bul. of Am. Main. of Way Assn. Gives data regarding prevailing practice, with diagrams. 2500 w. Eng Rec—Sept. 11, 1909. No. 7668.

A Concrete Fence and Retaining Wall. Warren J. Miller. Describes method of construction, giving itemized costs. Ills. Eng Rec—Aug. 21, 1909. No. 7309.

The Construction of Reinforced-Concrete Retaining Walls (Die Konstruktion von Eisenbetonstützmauern). F. Baumstark. Mathematical. Ills. 2000 w. Beton u Eisen—Oct. 26, 1908. No. 572 F.

Retaining Walls for Sloping Ground (Gli Speroni in Muratura per Sostegno delle Terre nelle Scarpate). Lorenzo Caracciolo. Mathematical discussion of their design. Ills. 3500 w. Ing Ferro—June 15, 1909. No. 6557 D.

A Large Retaining Wall at Tacoma, Louis P. Zimmerman. Brief illustrated description of one of the largest concrete retaining walls on the Pacific Coast. 1000 w. Eng Rec—Nov. 28, 1908. No. 697.

Reinforced Concrete Retaining Wall at St. George, Staten Island. Louis L. Tribus. From a paper before the Munic. Engrs. of the City of N. Y. An illustrated description of the design and construction. 3500 w. Munic Engng—Feb., 1909. No. 2335 C.

A Large Concrete Retaining Wall. Illustrated detailed description of harbor work in Pittsburg. 2500 w. Eng Rec—April, 1909. No. 3689.

A Reinforced-Concrete Retaining Wall Along the Bank of the Ohio River. Frank

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Roofs

A. Bone. Illustrated description of a novel design constructed at Evansville, Ind. 600 w. Eng News—June 3, 1909. No. 5220.

Roofs.

Self-Supporting Curved Iron Roofs. T. McGill. Considers their limitations and details of construction. Ills. 500 w. Mech Wld—Sept. 10, 1909. Serial. 1st part. No. 7854 A.

Utilization of Material in Steel Roof Trusses (Zur Materialausnutzung des eisernen Dachbinders). Fritz Weiss. Mathematical discussion of the most economical disposition of metal. Ills. 3500 w. Zeitschr d Oest Ing u Arch Ver—Sept. 10, 1909. No. 8690 D.

A Flat Roof Supported by Reinforced-Concrete Beams (Solai a Travicelli di Cemento Armato, Soffittati in Piano). C. Marzocchi. Mathematical discussion of the design. Ills. 5500 w. Ann d Soc d Ing e d Arch Ital—Sept. 15, 1908. No. 539 F.

Queen-Post Roof Trusses. Walter Hey and Thomas R. Sturgeon. Presents a solution of the stresses. 1500 w. Engng—June 11, 1909. No. 5657 A.

The Use of Asphaltum. Harry Larkin. Information concerning the uses and proper management of asphaltum work, the need of intelligent application, etc. 4500 w. Jour Assn of Engng Socs—Dec., 1908. No. 2415 C.

Tin Roofs on Chemically Fireproofed Sheathing Boards. H. N. Taylor. Reports a case where contact of tin with fireproofed timber caused corrosion. 1200 w. Met Work—Jan. 30, 1909. No. 2171.

Kahn Reinforced Concrete Roof Over Extension to National Gallery. Illustrated description of interesting work in progress in London. 600 w. Engng—April 23, 1909. No. 4461 A.

Specifications.

Specifications for Engineering Works. H. Laurence Butler. Read before the Civ. & Mech. Engrs.' Soc. Considers points that are essential to the production of a specification that shall fulfil its purpose. 3500 w. Surveyor—Jan. 15, 1909. No. 2055 A.

Suggestions for Drawing Specifications for Engineering Work. H. Laurence Butler. Read before the Civ. & Mech. Engng. Soc., Gt. Britain. Considers essential points of a specification that properly fulfils its purpose. 4500 w. Engng-Con—Feb. 3, 1909. No. 2297.

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Stacks.

Simple Method of Stack Design. A. J. Haire, Jr. Gives diagrams and explanation of their use. 900 w. Mach, N Y—Aug., 1909. No. 6868 C.

Design of Steel Draft Stacks. Birger F. Burman. Directions for calculating stresses, and different resultant forces. Ills. 3300 w. Eng Rec—July 17, 1909. No. 6402.

A Steel Chimney. Gives points in favor of such chimneys, illustrating a recent type. 800 w. Ir & Coal Trds Rev—April 2, 1909. No. 3915 A.

Reinforced Concrete Chimneys. Dr. Alfred Gradenwitz. Describes a chimney of concrete blocks erected in Belgium 125 feet in height. Ills. 900 w. Sci Am Sup—June 5, 1909. No. 5313.

New 506-Ft. Chimney at Great Falls Smelter. Edwin Higgins. Illustrated detailed description of this largest chimney in the world. 2500 w. Eng & Min Jour—Jan. 16, 1909. No. 1761.

The Chimney of the Boston & Montana Consolidated Copper & Silver Mining Company. Illustrated detailed description of the largest and highest chimney in the world, and its construction. 5500 w. Eng Rec—Nov. 28, 1908. No. 691.

The World's Largest Chimney: 50 x 506 ft. Brick Stack for the Boston & Montana Smelter at Great Falls, Mont. States the requirements and gives an illustrated description of the design and construction. 4000 w. Eng News—Nov. 26, 1908. No. 639.

Steel Buildings.

Essential Formulae in Structural Engineering. Horace Cubitt. Read before the Inst. of Munic. Engrs. Aims to show that the real essential formulae for structural engineering purposes are few. 3000 w. Archt, Lond—April 30, 1909. Serial, 1st part. No. 4594 A.

Secondary Stresses in Framed Structures. E. W. Pittman. Calls attention to faults in structural details causing these stresses, illustrating their effects on the strength of the structures. Discussion. 8000 w. Pro Engrs' Soc of W Penn—Feb., 1909. No. 3455 D.

Temperature Stresses in the Members of Steel Structures. States facts supporting the conclusion that the heat of the sun's rays may be great enough to form an appreciable addition to the load stresses. 2000 w. Eng News—Oct. 21, 1909. No. 8821.

Elastic Limit or Yield-Point as Guide for Working-Stresses. Editorial discus-

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sion giving reasons for attaching chief importance to the "yield-point." 1200 w. Eng News—Aug. 5, 1909. No. 6910.

The Influence of Rigid Rivetting at Junction Points on the Deflection of Beams (Der Einfluss der festen Knotenpunktvernetzung auf die Durchbiegung von Fachwerkträgern). Paul Müller. Mathematical and graphical discussion. Ills. 2800 w. Zeitschr d Ver Deutscher Ing—July 3, 1909. No. 7467 D.

The Design of Members Subjected to Combined Stresses. E. L. Hancock. Report of tests of steel under combined stresses, giving results in a form available for use. 1600 w. Eng News—Sept. 2, 1909. No. 7539.

The Design of Members Subjected to Combined Stresses. E. L. Hancock. A summary of tests made of steel under combined stresses of strain with tension, flexure and compression. 1200 w. Eng Rec—Oct. 9, 1909. No. 8432.

Methods of Designing Skew Connections in Complicated Steel Structures. Alexander Penden, Jr. Read at a students' meeting of the Can. Soc. of Civ. Engrs. Explains the way to determine such skew detailing, illustrating by actual connections. 2800 w. Engng-Con—June 9, 1909. No. 5353.

An Example of Defective Truss Construction. C. A. P. Turner. Illustrated discussion of dangerously defective structural steel frames. 1200 w. Eng News—June 17, 1909. No. 5576.

The Transverse Resistance of Rods of Variable Moment of Inertia (Ueber die Knickfestigkeit von Stäben veränderlichen Trägheitsmomentes). Fr. Engesser. Mathematical. Ills. 3500 w. Zeitschr d Oest Ing u Arch Ver—Aug. 20, 1909. No. 7985 D.

Recent Types of Steel Construction (Neuere Systemformen im Eisenhochbau). Franz Czech. Refers particularly to long-span roof trusses for industrial buildings. Ills. 2200 w. Stahl u Eisen—Aug. 25, 1909. No. 7957 D.

Static Design of a Beam of 17.45 Metres Span (Calcul statique d'une Poutre de 17.45 m. de Portée). Herr Hattingerff. Mathematical discussion of the design of a plate girder to support an inclined reinforced-concrete roof. Ills. 4000 w. All Indus—Sept., 1909. No. 8621 D.

Bending Moment Diagram. On the application of graphic methods to the study of beams and girders. 1000 w. Am Mach—Vol. 32, No. 2. No. 1750.

Structural Details in the New Grand Central Station, New York. Describes

features of a very difficult problem in construction work. The building of a very large station on a site where over 1,000 train movements daily are constantly maintained. 3000 w. Eng Rec—Jan. 23, 1909. No. 2023.

Structural Details in the New Theatre, New York. Illustrated detailed description of floor girders, roof trusses, and other details. 2800 w. Eng Rec—Dec. 26, 1908. No. 1246.

The Metropolitan Tower. An illustrated detailed study of the structural features of the building from the constructor's viewpoint. Plates. 9000 w. Am Arch—Oct. 6, 1909. No. 8382 D.

The Emigrant Industrial Savings Bank Building, New York. Plans and description of problems of interest in constructing a building on the same and adjoining land, without interruption of business in the original structure. 2500 w. Eng Rec—Oct. 2, 1909. No. 8236.

Structural Details in the Farmers' Loan & Trust Building, New York. Illustrated description of wind bracing, cantilever girders, etc. 3000 w. Eng Rec—Feb. 20, 1909. No. 2564.

The Extension to Masonic Hall, New York City. Illustrated detailed description of a steel-cage office structure of 21 stories. 2000 w. Eng Rec—March 13, 1909. No. 3105.

Special Structural Steel Work in the La Salle Hotel, Chicago. Illustrates and describes special features in steel framing. 2200 w. Eng News—Dec. 3, 1908. No. 773.

Steel work in the La Salle Hotel, Chicago. Description of structural-steel frame work of a 22-story building, 260 ft. in height and 180 by 180 in plan. Ills. 3000 w. Eng Rec—June 5, 1909. No. 5283.

The Humboldt Savings Bank Building, San Francisco. C. Derleth, Jr. Describes building methods for this earthquake district adopted since the fire. Ills. 5500 w. Eng Rec—Nov. 21, 1908. No. 413.

The Alaska Commercial Building, San Francisco. Illustrated description of a 12-story and basement building, designed to resist earthquakes and fire. Located where quicksand and difficult foundation conditions were encountered. 1800 w. Eng Rec—Feb. 6, 1909. No. 2310.

The Metropolitan Life Building, San Francisco. Illustrates and describes details of a concrete and steel structure of interest. 1000 w. Eng Rec—Sept. 11, 1909. No. 7672.

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Structural Details of the Carnegie Technical School, Pittsburgh. Illustrates and describes details of steel cage construction. 1600 w. Eng Rec—Dec. 5, 1908. No. 833.

The Allegheny County Soldiers' Memorial. Section, plans and description of a fireproof public building in Pittsburgh, having interesting features of structural steel work. 2200 w. Eng Rec—March 6, 1909. No. 2972.

Erecting the Allegheny County Soldier's Memorial. Illustrated description of the erection of a steel-frame building in Pittsburgh, Pa. 1000 w. Eng Rec—May 15, 1909. No. 4690.

The Philadelphia Opera House. Illustrated description of interesting details of a brick and steel structure and of the methods of erection. 3000 w. Eng Rec—Jan. 30, 1909. No. 2181.

The Y. M. C. A. Central Building, Philadelphia. A 6-story steel-frame structure, having interesting features of equipment and arrangement requiring in some cases special treatment of the steel framework. Ills. 2000 w. Eng Rec—Sept. 18, 1909. No. 7818.

The Racquet Club House, Philadelphia. Illustrates and describes a building having unusual features to meet special requirements. 1500 w. Eng Rec—Aug. 21, 1909. No. 47306.

The Engineering Features of the Athletics' Baseball Park. Michael Monaghan. Illustrates and describes structural-steel work, reinforced-concrete work, etc., of a building in Philadelphia. 2500 w. Pro Engrs' Club of Phila—April, 1909. No. 7113 D.

The Prudential North Building Addition. Illustrated description of a new 12-story extension in Newark, N. J. 1200 w. Eng Rec—Sept. 25, 1909. No. 8064.

The Boston Safe Deposit & Trust Company's Building. Illustrated detailed description of a steel-cage building, 10-stories above the curb. 2500 w. Eng Rec—July 3, 1909. No. 6177.

The Denver Stock Pavilion. Illustrated description of a one-story steel building unobstructed by columns, and surrounded on all sides by inclined tiers of seats. 900 w. Eng Rec—July 17, 1909. No. 6401.

The St. Paul Auditorium. Laurence A. Ball. Plans and description of the building, with discussion of its engineering features. 5000 w. Pro Brooklyn Engrs' Club, No. 85—1908. No. 5876 F + F.

Structural Features of the Pope Building, Cleveland, Ohio. Illustrates and de-

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scribes interesting features due to difficult foundations and irregular plan. 1600 w. Eng Rec—Oct. 31, 1908. No. 21.

Structural Frames of the Open-Hearth Buildings at Gary. Illustrated detailed description of buildings of unusual structural interest. 2500 w. Eng Rec—Oct. 9, 1909. No. 8431.

Steel Construction in the New Kiel Theatre (Eisen-Konstruktionen im neuen Stadttheater in Kiel). O. Leitholf. Illustrated description of a complicated structure. Serial. 1st part. 2300 w. Deutsche Bau—Feb. 20, 1909. No. 3383 B.

Raising and Strengthening the Oversea Platforms of a Coaling Station at St. Vincent. Walter Sidney Harvey. Describes the construction of this coaling station on the Cape Verde Islands, and recent repairs. Ills. 2500 w. Inst of Civ Engrs—No. 3731. No. 886 N.

See also Coal Pockets, Domes, and Roofs, under CONSTRUCTION; Steel, under MATERIALS OF CONSTRUCTION; Water Towers, under WATER SUPPLY; Docks and Ferry Houses, under WATERWAYS AND HARBORS; Derricks, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING; Rivet Holes and Rivetted Joints, under MECHANICAL ENGINEERING, MACHINE ELEMENTS AND DESIGN; and Terminals, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS.

Swimming Pools.

The Swimming Pool for the University of Minnesota. F. H. Constant. Illustrated description of a pool costing about \$7,000, under construction. 2000 w. Minn Engr—Nov., 1908. No. 1359 C.

See also same title under MUNICIPAL.

Tanks.

Reservoirs for Petroleum Dregs for Rumanian State Railways. From *Revue Gen. des Chemins de fer*. Illustration and brief description of novel storage tanks. 500 w. R R Age Gaz—April 23, 1909. No. 4156.

Timber Splicing.

A Neglected Splice for Timber Tension Members. Robert Fletcher. Discusses forms of splicing used, and their applications. 1500 w. Eng News—May 20, 1909. No. 4776.

Tunneling Machines.

A Machine for Boring Rock Tunnels. Illustrated description of the Terry, Tench and Proctor Co.'s rock tunnel drilling machine. 1200 w. Eng News—Nov 19, 1908. No. 378.

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Tunnel Lining

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A Tunnel-Boring Machine. Illustrated description of a machine designed by E. F. Terry and O. S. Proctor, said to be capable of driving an 8-foot tunnel in rock without blasting. 1000 w. *Sci Am*—Jan. 9, 1909. No. 1644.

Tunnel Lining.

Method of Lining the Second Bergen Hill Tunnel of the Lackawanna Railroad. Describes the interesting forms used, the methods of bringing in the materials, and the excellent surface and alignment. 2500 w. *Eng Rec*—Oct. 31, 1908. No. 23.

Reinforced-Concrete Tunnel Lining in the Götterborn Mine (Eisenbetonausbau einer Richtstrecke in der Königl. Steinkohlengrube Götterborn, Saargebiet). W. Stark. Illustrated description of the work. 2200 w. *Beton u Eisen*—Oct. 9, 1908. No. 576 F.

Injection of Cement Grout in the Col des Montets Tunnel on the Line from Fayet to the Swiss Frontier (Note sur les Injections de Ciment pratiquées dans le Souterrain du Col des Montets, Haute-Savoie, sur la Ligne du Fayet à la Frontière suisse). E. Nivert. Describes the apparatus and methods. Ills. 5000 w. *Rev Gen des Chemins de Fer*—March, 1909. No. 4219 G.

Tunnels.

Methods of Tunnel Work and Cost Data on an Irrigation Project. Henry A. Young. Describes work on the Huntley Project, Mont., giving cost data. 1500 w. *Eng News*—Feb. 4, 1909. No. 2277.

Records of Driving Rock Tunnels and Some Comment on the High Cost of the Elizabeth Tunnel. Information relating to work on the tunnel that is to carry the waters of the Los Angeles aqueduct through the Coast Range. 1200 w. *Engng Con*—Dec. 9, 1908. No. 922.

A New World's Record of Progress in Rock Tunneling; Red Rock Tunnel, Los Angeles Aqueduct. Account by J. B. Lippincott in regard to the record made, also editorial. 2000 w. *Engng-Con*—Oct. 20, 1909. No. 8793.

Driving Headings in Rock Tunnels. W. L. Saunders. Deals especially with heading-driving, and gives tunneling records for America and Europe, describing methods and machines. Ills. 8500 w. *Bul Am Inst of Min Engrs*—April, 1909. No. 4084 F.

Tunnel Driving Records. R. L. Herri-
rick. A comparison of methods and speeds in America with other countries. 5500 w. *Mines & Min*—April, 1909. No. 3675 C.

Practical Test of a Tunnel Boring Machine. John Tyssowski. Illustrates and describes the machine and its work in excavating a drain tunnel near 46th St., New York City. 1000 w. *Eng & Min Jour*—June 26, 1909. No. 6012.

The Sigafos Tunnel Machine. Rowland Ashford Phillips. Illustrated detailed description of a rotary tunneling machine recently given trial with great success. 1600 w. *Sci Am*—May 22, 1909. No. 4903.

Tunnels and Subways. Illustrations and information in regard to these interesting engineering works in New York City and some of the difficulties met. 3000 w. *Sci Am*—Dec. 5, 1908. No. 815.

Special Concrete Structures, in the Hudson River Tunnels. W. M. Torrance. Illustrated description of the design and construction, with discussion. 9500 w. *Jour W Soc of Engrs*—Oct., 1908. No. 357 D.

The Cortlandt Street Tunnel Under the Hudson River; Meeting of Headings. A brief account of the junction, outlining the work. 800 w. *Eng News*—Feb. 4, 1909. No. 2276.

East River Tunnel from South Ferry to Joralemon Street. Frederick C. Noble. Gives the history and illustrated general description of the tunnel and methods of construction. Discussion. Ills. 9000 w. *Pro Brooklyn Engrs' Club*, No. 80—1908. No. 5871 F + F.

The New York Tunnel Extension of the Pennsylvania Railroad. The East River Division. Alfred Noble. An introductory outline of work to be described in detail in later papers. Plans. 4500 w. *Pro Am Soc of Civ Engrs*—Sept., 1909. No. 8183 E.

The New York Tunnel Extension of the Pennsylvania Railroad. Charles W. Raymond. A brief description of the general plan adopted for conducting traffic into and through New York, considerations involved in designing the work, and the effects expected. Map and plans. 9500 w. *Pro Am Soc of Civ Engrs*—Sept., 1909. No. 8182 E.

The New York Tunnel Extension of the Pennsylvania Railroad. The East River Tunnels. James H. Brace, Francis Mason, and S. H. Woodard. An illustrated article considering the construction of these tunnels. 21500 w. *Pro Am Soc of Civ Engrs*—Oct., 1909. No. 8843 E.

The New York Tunnel Extension of the Pennsylvania Railroad. The Cross-Town Tunnels. James H. Brace and Francis Mason. Illustrated description of the

construction of the tunnels extending eastward from the easterly extension of the Terminal Station to the permanent shafts east of First Avenue. 3000 w. Pro Am Soc of Civ Engrs—Oct., 1909. No. 8842 E.

Plant for Constructing a Concrete Tunnel Roadbed. Describes methods of construction used on the second Bergen Hill tunnel, by the D. L. & W. R. R., at Hoboken, N. J. 1700 w. Eng Rec—April, 1909. No. 3693.

The Tunnel of the New York, New Haven & Hartford Railroad at Providence, R. I. An account of railroad improvements, especially describing the tunnel, about 5,080 ft. long. Ills. 4500 w. Eng Rec—Nov. 7, 1908. No. 138.

The Tunnel Under the Detroit River. Norman B. Beasley. Brief description, with illustrations. 900 w. Sci Am Sup—Oct. 9, 1909. No. 8415.

The Detroit River Tunnel. Illustrates and describes this interesting work. 2500 w. Engr, Lond—Feb. 19, 1909. No. 2898 A.

The Connection Between the Westerly Approach and the Subaqueous Sections of the Detroit River Tunnel. An illustrated description of the methods adopted. 2000 w. Eng Rec—Jan. 30, 1909. No. 2175.

Progress of the Southwest Water Tunnel in Chicago. Illustrated detailed description of methods used in constructing this water supply tunnel. 4000 w. Eng Rec—Aug. 7, 1909. No. 6946.

The Report of the Coroner's Jury on the Chicago Tunnel Crib Disaster. A report of the burning of the superstructure of a temporary crib over a working shaft of a new intake tunnel at Chicago. 2500 w. Eng News—Feb. 25, 1909. No. 2758.

Building the Raton Tunnels. Joseph Weidel. An illustrated account of the construction of the new tunnels on the Santa Fe R. R. in New Mexico. 4000 w. Cal Jour of Tech—Nov., 1908. No. 1796.

Methods and Cost of Constructing the New Raton Tunnel for the Atchison, Topeka & Santa Fe Ry. Co., at Raton Pass, New Mexico. Jos. Weidel. Ills. 4000 w. Engng-Con—March 3, 1909. No. 3024.

Rapid Progress in a Hard-Rock Tunnel. A report of the rate of speed attained on the Roosevelt drainage tunnel at Cripple Creek, Colo. 1500 w. Eng Rec—May 1, 1909. No. 4390.

Roosevelt Tunnel. R. L. Herrick. Describes the successful system of driving a tunnel through unusually hard rock, after

it had been given up by three contractors. Ills. 5500 w. Mines & Min—April, 1909. No. 3670 C.

The Gunnison Tunnel of the Uncompahgre Valley Project, United States Reclamation Service. I. W. McConnell. Map and illustrated description of the construction of the longest irrigation tunnel in the world. 7000 w. Eng Rec—Aug. 28, 1909. No. 7382.

The Gunnison Tunnel. Frank A. Newton. Describes work in connection with the irrigation system of the Uncompahgre Valley Project in the arid regions of the west. Ills. 1600 w. Wis Engr—Feb., 1909. No. 4317 D.

Methods and Cost of Tunneling on the Alaska Central Railway. Compiled from a paper by G. A. Kyle, read before the Pacific North-West Society of Engrs. 3500 w. Engng-Con—April 7, 1909. No. 3873.

New Intake Tunnel. G. W. Allen. Illustrated detailed description of the construction of a tunnel under Toronto Bay in connection with the Toronto water supply. 2000 w. Can Engr—Jan. 29, 1909. No. 2167.

The Rotherhithe Tunnel. Edward Henry Tabor. Illustrated description of the construction of this tunnel under the Thames. Also discussion. 27500 w. Inst of Civ Engrs, No. 3743—Dec. 8, 1908. No. 6448 N.

The Reconstruction of a Portion of the Cwm Cerwyn Tunnel. Illustrates and describes method of reconstructing 180 ft. of a tunnel on the Port Talbot Railway, in South Wales, without interference of traffic. 2000 w. Engr, Lond—Dec. 4, 1908. No. 1022 A.

Methods Employed in Driving Alpine Tunnels: The Loetschberg Tunnel. Walton I. Aims. Explains methods that have made possible more rapid driving than has yet been attained in America. 1500 w. Eng News—Dec. 31, 1908. No. 1407.

Rapid Methods in Driving Alpine Tunnels. Walter I. Aims. Results of the writer's observations on a recent visit to the Loetschberg tunnel, Switzerland. 1400 w. Compressed Air—Feb., 1909. No. 2412.

Problems in the Construction of Deep-Lying Alpine Tunnels and Experiences in Building the Simplon (Das Problem des Baues langer, tiefliegender Alpentunnels und die Erfahrungen beim Baue des Simplontunnels). Karl Brandau. A practical description of the solution of problems in the Simplon tunnel. Ills. Serial, 1st part. 2800 w. Schweiz Bau—Jan. 2, 1909. No. 2688 B.

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The Loetschberg Tunnel. H. Prime Kieffer. Illustrated description of the construction of this tunnel under the Bernese Alps. 2500 w. R. R. Age Gaz—July 2, 1909. No. 6127.

The Catastrophe at the Lötschberg Tunnel. A. Trautweiler. An illustrated article describing the inburst of July 24. 2800 w. Bul Int Ry Cong. Feb., 1909. No. 3280 G.

Building the Simplon Tunnel (Der Bau des Simplontunnels). Konrad Preszel. A review and detailed description of the work. Ills. Serial, 1st part. 2000 w. Zeitschr d Oest Ing u Arch Ver—June 11, 1909. No. 6594 D.

The Railway Through Mont Blanc. Discusses this project of constructing a new international railway through the Western Alps. 4000 w. Bul Int Ry Cong—Feb., 1909. No. 3281 G.

A New Twelve-Mile Italian Tunnel. Illustrated account of the proposed new tunnel between Genoa and Milan. 2500 w. Engr, Lond—Feb. 12, 1909. No. 2703 A.

The Crossing of Sidney Harbor, New South Wales. An account of the final solution of conveying passengers across a deep and wide tidal channel, by constructing a tunnel similar to the system employed at the Detroit River. 2000 w. Engr, Lond—May 14, 1909. No. 4968 A.

Bridge and Tunnel Projects for Crossing the Harbor of Sydney, New South Wales. An illustrated description of the projects for furnishing direct communication across the harbor. Also editorial on the relative merits of bridges and tunnels for river crossings. 3500 w. Eng News—July 29, 1909. No. 6774.

The Great Otira Tunnel. W. Wilson. An illustrated account of a notable engineering undertaking in New Zealand. 2000 w. Cassier's Mag—Oct., 1909. No. 8461 B.

See also Concrete, under CONSTRUCTION; Sewers, under MUNICIPAL; Drilling, under MINING AND METALLURGY, MINING; Tunnels, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS; and Subways, under STREET AND ELECTRIC RAILWAYS.

Underpinning.

Method of Underpinning a Building Wall with a 55-Ft. Span Reinforced-Concrete Girder. Explains conditions and describes work at the waterworks pump house at Evansville, Ind. Ills. 1000 w. Engng-Con—Jan. 27, 1909. No. 2141.

Underpinning a Building With a Concrete Girder 105 Feet Long. Illustrated

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description of the methods employed in building a large concrete girder at Evansville, Ind., for the water works pumping station foundation. 1500 w. Eng News—March 4, 1909. No. 2995.

Underpinning the Homeopathic Hospital, Pittsburg Explains conditions, and describes methods of underpinning this large brick building while making the necessary repairs. Ills. 1200 w. Eng Rec—April 3, 1909. No. 3696.

The Knickerbocker Trust Building Substructure. Describes and illustrates interesting details in the method of protecting an adjacent structure, while erecting a 22-story steel cage office building on soil consisting of quicksand underlaid with a stratum of hardpan. 4000 w. Eng Rec—April 24, 1909. No. 4169.

Underpinning a Leaning Chimney with Concrete Caissons. Ogden Merrill. Illustrated description of methods used in Jersey City, N. J. 1000 w. Eng News—July 1, 1909. No. 6086.

Wage Systems.

See same title, under INDUSTRIAL ECONOMY.

Walls.

The Stability of Walls. Henry Adams. Read before the Soc. of Archts. Deals only with walls which have no load but their own weight to support, and no thrust but the wind to resist, discussing the general principles that determine stability. 5000 w. Surveyor—Jan. 15, 1909. No. 2054 A.

Waterproofing.

Waterproofing—An Engineering Problem. Myron H. Lewis. Explains the meaning of the term in its broad sense, and the importance to engineers, discusses the design of waterproof systems, and related subjects. Discussion. 16000 w. Pro Engrs' Club of Phila—Oct., 1908. No. 4324 D.

On Waterproofing Concrete. A brief summary of what is being done in improving methods. 2000 w. Sci Am—Oct. 2, 1909. No. 8212.

Methods of Waterproofing Concrete Covered Steel Floors for Railway Bridges with Some Figures on Cost. Methods given in a committee report before a recent convention of the Assn. of Am. Ry. Supts. of Bridges and Buildings. Ills. 3000 w. Engng-Con—Nov. 4, 1908. No. 118.

Tests of Alum and Soap Waterproofing. Abstract from the *Technograph* of tests made at the University of Illinois. 1500 w. Eng Rec—Oct. 9, 1909. No. 8441.

Waterproofing

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Foundation Waterproofing in the State Education Building. Illustrates and describes waterproofing of hydrolithic cement on a building in Albany, N. Y. 2000 w. Eng Rec—Oct. 16, 1909. No. 8599.

Tank Construction for Excluding Water from a Basement. Describes the reinforced-concrete tank for waterproofing the sub-basement of the Keyser Building in Baltimore, Md. Ills. 1500 w. Eng Rec—Jan. 9, 1909. No. 1573.

Waterproofing Reinforced Concrete Coal Bunkers. A. T. Schreiber. De-

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scribes interesting work in Philadelphia, illustrating the use of Wunners bitumen-emulsion waterproofing. 1800 w. Eng Rec—Feb. 27, 1909. No. 2849.

See also Reinforced Concrete, under CONSTRUCTION; and Refrigeration, under MECHANICAL ENGINEERING, HEATING AND COOLING.

Wrecking.

Wrecking the Old City Hall in Chicago. Brief description of the removal of massive buildings. Ills. 1500 w. Eng Rec—May 15, 1909. No. 4693.

MATERIALS OF CONSTRUCTION

Asphalt.

Confusion as to Asphaltic Specifications. H. Tipper. A criticism of the specifications for paving, and suggestions from a paper by Dr. Albert Sommer. 2500 w. Eng News—Oct. 7, 1909. No. 8403.

Brick.

The Strength and Absorption of Brick, and a Comparison Between Different Methods of Determining Absorption. Reviews two papers by James E. Howard, read before the Nat. Brick Mfrs. Assn. 1200 w. Eng News—March 11, 1909. No. 3104.

Tests of Brick Columns and Terra Cotta Block Columns. Arthur N. Talbot and Duff A. Abrams. Describes tests made of 16 short columns of brick and 16 columns built of terra cotta blocks. Ills. 11000 w. Univ of Ills, Bul No. 27—Sept. 29, 1908. No. 3808 N.

Silico-Calcareous Bricks. E. Leduc. From a paper in the *Bul de la Soc. l'Encour, pour l'Ind. Nat.* Deals with the history, economic development, manufacture, etc. 3000 w. Quarry—May, 1909. Serial, 1st part. No. 4660 A.

Investigation of Sand-Lime Mixtures (Essais sur le Silico-Calcaire). E. Leduc and Ch. de la Roche. Gives results of elaborate laboratory experiments and a review of the sand-lime brick industry in England, Germany and Holland. Ills. 40000 w. Bul du Lab d'Essais—Nov. 13, 1908. No. 7908 N.

See also same title, under CONSTRUCTION; and Concrete, under MATERIALS OF CONSTRUCTION.

Cement.

The Association of German Portland Cement Manufacturers; Summary of Proceedings for 1908. New German Cement Specifications. Robert W. Lesley and E.

W. Lazell. Portion of a paper read before the Assn. of Am. Portland Cement Mfrs. 2000 w. Eng News—Dec. 24, 1908. No. 1239.

The Nature of Portland Cement. Edward Godfrey. Explains the nature of the substance as shown by physical tests and experience. 3000 w. Eng Rec—Oct. 16, 1909. No. 8596.

Some Notes Relating to the Setting of Portland Cement, with Description of Methods Adopted for Regulating the same. H. K. C. Bamber. A résumé of results of research work. 3500 w. Archt, Lond—June 4, 1909. Serial. 1st part. No. 5512 A.

The Setting of Portland Cement and Its Regulation. Reviews a recent paper by H. K. G. Bamber before the Concrete Institute of Great Britain. 4500 w. Eng Rec—June 26, 1909. No. 5997.

The Action of Frost on Cement and Cement Mortar, Together with Other Experiments on These Materials. Ernest R. Matthews, and James Watson. Describes in detail a series of experiments, giving results of interest and value. 3000 w. Pro Am Soc of Civ Engrs—Jan., 1909. No. 2122 E.

Hardening Hydraulic Cements. Dr. W. Michaelis, Sr. Abstract of paper before the Assn. of German Cement Mfrs. Describes a new process. 4500 w. Sci Am Sup—Jan. 9, 1909. Serial, 1st part. No. 1648.

Determination of the Effect of Age and Exposure upon the Tensile Strength of Portland Cement Before Use. Charles C. Phelps, Gilbert C. Ridgway, Edward A. Ward, and Bigelow Watts. From a graduation thesis. Report of tests. Ills. 5000 w. Stevens Ind—April, 1909. No. 6629 D.

The Action of Sea and Fresh Water on Cement and Concrete. Ernest R. Mat-

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thews. Gives conclusions reached by three well-known authorities after a series of tests, and also particulars of the writer's experiments. 3000 w. Surveyor—March 12, 1909. No. 3407 A.

Cement in Sea-Water. A. Poulsen. Report on the trials in Norway and Sweden commenced in 1896, with results. Ills. 4500 w. Soc Scandinavian Port Cement Mfrs—Sept., 1909. No. 7788 N.

Portland Cement for Use in the Tropics. Richard K. Meade. Reviews an article on Portland Cement Testing which appeared in "The Philippine Journal of Science," of June, 1908, combating the attempt to show that a special cement is demanded for use in the tropics. 2500 w. Eng News—April 8, 1909. No. 3850.

The Behavior of Cement towards Liquids and Metals (Das Verhalten des Zements gegen Flüssigkeiten und Metalle). Dr. Rohland. A discussion of the chemistry of hardening in hydraulic cements. 3000 w. Zeitschr d Oest Ing u Arch Ver—March 19, 1909. No. 4280 D.

The Effect of Electrolytes on the Setting of Cement (Die Wirkung von Elektrolyten auf die Zementabbindeung). Dr. Rohland. Considers the influence of various salts. 2500 w. Stahl u Eisen—Dec. 9, 1908. No. 1942 D.

Disintegration of Fresh Cement Floor Surfaces by the Action of Smoke Gases at Low Temperatures. Alfred H. White. Read before the Am. Soc. for Test. Mat. Gives data as to manner of laying the floors, and the investigations made. 1300 w. Engng-Con—July 14, 1909. No. 6330.

See also Mortar, under MATERIALS OF CONSTRUCTION; Drainage, under MUNICIPAL; and same title, under MINING AND METALLURGY, MINOR MINERALS.

Cement Blocks.

The Present and Future of the Cement Block. J. Augustine Smith. Extracts from a paper read before the Nat. Assn. of Cement Users. Reviews the development of this material and considers the outlook promising. 3500 w. Cement Age—April, 1909. No. 4080.

Cement Testing.

Report of the Committee on Testing Cement and Cement Products. E. S. Larned. From Pro. Nat. Assn. of Cement Users. On the use of cement blocks, giving standard specifications. 5000 w. Cement—Oct., 1908. No. 115 C.

The Micrographic Examination of Cement (Ueber micrographische Zementuntersuchung). Ernst Stern. Describes the

utility of microscopic examination, methods used, etc. Ills. 3000 w. Stahl u Eisen—Oct. 21, 1908. No. 547 D.

The Micrographic Study of Portland Cement (Lo Studio micrografico del Cemento Portland). A discussion of its usefulness, with illustrations. 2500 w. Il Cemento—April 30, 1909. No. 4849 D.

See also Cement Testing, under MEASUREMENT.

Concrete.

Building Materials. H. D. Searles-Wood. Read before the Archt. Assn., London. Deals with concrete, both plain and reinforced, mortar, bricks, stone, and wood. Discussion. 12000 w. Builder—Jan. 16, 1909. No. 2046 A.

Concrete Aggregates. Explains the scope of a special commission of the British Fire Prevention Committee to report on suitable aggregates for concrete floors intended to be fire-resisting. 2000 w. Surveyor—Jan. 8, 1909. No. 1809A.

Strength of Concrete Joints. Joshua L. Miner. Reports results of a series of tests made in the laboratories of Lafayette College. Ills. Discussion. 4500 w. Pro Engrs' Soc of W Penn—Dec., 1908.

Progress Report of Special Committee on Concrete and Reinforced Concrete. A report of the present judgment of the Committee concerning the proper use of these materials. 10500 w. Pro Am Soc of Civ Engrs—Feb., 1909. No. 3457 E. No. 1744 D.

Progress Report of Special Committee on Concrete and Reinforced Concrete. Continued discussion. 8000 w. Pro Am Soc of Civ Engrs—Sept., 1909. No. 8187 E.

The Dangers of Breeze Concrete. Discusses the experiments recently carried out by D. B. Butler. Ills. 1000 w. Engng—April 30, 1909. No. 4625 A.

Good Concrete and How to Get It. Frank M. Okey. From a paper before the Iowa Cement Users Assn. Discusses the effect of the different materials used. 2000 w. Munic Engng—May, 1909. No. 4549 C.

Influence of Storing Gauged Cement Mortar or Concrete Upon Its Capacity for Hardening. H. Burchartz. Results of comparative tests. 800 w. Cement Age—July, 1909. No. 6443.

The Compressive Resistance of Blocks and Columns of Concrete and Stone. A study of the stresses produced by compression and methods of increasing the resistance. 2500 w. Cement—Aug., 1909. No. 7569 C.

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Paints

Tests of Plain and Reinforced-Concrete Columns. M. O. Withey. Read before the Am. Soc. for Test. Mat. Reports tests made in the laboratory at the Univ. of Wis. during the past year. 2500 w. Eng News—Sept. 16, 1909. No. 7896.

Impurities in Sand for Concrete. An informal discussion at the annual convention, July 8, 1909. 6000 w. Pro Am Soc of Civ Engrs—Sept., 1909. No. 8189 E.

Destruction of Concrete by Alkali. William P. Headden. Gives results of experiments. 2500 w. Colc Agri College, Bul. 132—Sept., 1908. No. 651 N.

Tests on the Effect of Electric Current on Concrete. U. James Nichols. Abstract of a paper presented for a degree at the Mass. Inst. of Tech. A report of the experimental work. Also editorial. 4500 w. Eng News—Dec. 24, 1908. No. 1237.

Structural Materials in Parts of Oregon and Washington. N. H. Darton. Reports results of an investigation intended mainly to ascertain local resources of the gravel, sand, and crushed rock used in concrete. Ills. 11500 w. U S. Geol Surv—Bul. 387. No. 8146 N.

See also Concrete, under CONSTRUCTION; and Cement, Reinforced Concrete and Mortar, under MATERIALS OF CONSTRUCTION.

Fireproof.

Comparative Fire Tests of Various Building Materials; Brick, Concrete, Clay, Tile and Stone. Condensed from Bul. 370, U. S. Geol. Survey, by Richard L. Humphrey. 13500 w. Engng-Con—July 14, 1909. No. 6332.

The Fire-Resistive Properties of Various Building Materials. Richard L. Humphrey. Explains the character of investigations made, the materials tested, apparatus used, methods of conducting tests, and the results. Ills. 28000 w. U S Geol Surv—Bul. 370. No. 6454 N.

Fireproofing.

Fireproofing Solutions (Feuersichere Imprägnierungsmittel). Herr Wendt. Describes various materials used for impregnating wood, etc., for fireproofing purposes. 2500 w. Gesundheits-Ing—April 24, 1909. No. 4890 D.

Inflammable Substances. William H. Hunt. Discusses inventions for rendering wood and textiles fireproof. 1500 w. Cal Jour of Tech—Sept., 1909. No. 7880.

Lime.

The Testing of Lime for Building Uses. A. G. Larsson. Proposes simple methods of testing. 2000 w. Con Rec—May 12, 1909. No. 4677.

Mortars.

The Chemical and Microscopic Study of Mortar, Cement, and Pozzuolana. Summary of effects observed by different examiners. 1500 w. Builder—Aug. 7, 1909. No. 7082 A.

Calcium Aluminates; Their Effect on Mortars. Henry S. Spackman. Gives analyses and tests with results. 4000 w. Jour Fr Inst—March, 1909. No. 3250 D.

The Adhesion of Mortar and Concrete. R. Feret. Information concerning the adhesion to various materials, giving rules for building of structures where adhesion is of prime importance. 1500 w. Cement—Sept., 1909. No. 8506 C.

The Decomposition of Mortars by Waters Containing Sulphates (Experiences sur la Décomposition des Mortiers par les Eaux sulfatées). J. Bied. Read before the Congress of Applied Chemistry. Results of investigations. Ills. 7500 w. Rev. de Métal—June, 1909. No. 6514 E + F.

Trass, Trass-Cement, and Cement-Lime Mortars (Einiges über Trass-, Trasszement- und Zementkalkmörtel). Heinrich Renzeder. Results of investigations of their properties. Ills. 5500 w. Oest Wochenschr f d Oeffent Baudienst—July 10, 1909. No. 7455 D.

See also Cement and Concrete, under MATERIALS OF CONSTRUCTION.

Paints.

Excluding and Rust Inhibiting Properties of Paint Pigments for the Protection of Steel and Iron. Henry A. Gardner. Abstract of a paper read before the Mas. Car. & Loc. Painters' Assn. Aims to give new light on the subject of pigments, which will assist in selecting the proper pigments for various uses. 2500 w. Engng-Con—Oct. 6, 1909. No. 8417.

Protective Coatings for Structural Material. R. S. Perry. Outlines scientific investigations in this field, and discusses properties of pigments, methods of testing, etc. Discussion. 10500 w. Jour W Soc of Engrs—June, 1909. No. 5879 D.

Physical Tests of Protective Coatings for Iron and Steel. J. Cruickshank Smith. Read before the Iron and Steel Inst. On the value of such tests in the selection of protective coatings. 2500 w.

Waterproof and Fireproof Paints (Peintures sous-marines et Peintures ignifuges). Ch. Coffinier. Read before the Congress of Applied Chemistry. Discusses the materials available, particularly for marine work. 2200 w. Rev de Métal—June, 1909. No. 6512 E + F.

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Paving Brick

Artificial Magnetic Oxide of Iron. F. J. R. Carulla. Read before the Ir. & St. Inst. Claiming that William Gregory first discovered the artificial production of magnetic oxide of iron, and matters relating to this productive paint. 1500 w. Engng—Oct. 15, 1909. No. 8937 A.

Rust Proof Coating for Steel. William Elsberg. Brief account of the process invented by George A. Goodson. Ills. 1200 w. Minn Engr—Nov., 1908. No. 1360 C.

Paving Brick.

Improvement in Manufacture of Paving Brick. Diagrams and description of the Dunn Cutting device. 2000 w. Contract Rec—April 14, 1909. No. 4016.

Reinforced Concrete.

Reinforced Concrete. Arthur C. Auden. Remarks on its lasting qualities, the materials used, and their comparative value, reinforcement, the uses to which this material is applied, etc. Ills. 8000 w. Inst' of Mech Engrs—July, 1909. No. 6983 N.

A Hearing on Reinforced Concrete in the Revision of the New York Building Code. Gives extracts from the statements made at this hearing, in regard to reinforced concrete and cinder concrete. Also editorial. 5000 w. Eng News—June 10, 1909. No. 5463.

Reinforced Concrete as a Fireproof Building Material. Leonard C. Wason. A paper presented before the Nat. Fire Protective Ass'n, which discusses the use of concrete and its fire-resisting properties. 2450 w. Engng-Contr—June 2, 1909. No. 5305.

The Composition and Uses of Plain and Reinforced Concrete. Charles F. Marsh. Read before the Concrete Inst. Briefly discusses the mixing, aggregates, waterproofing, nature of reinforcement, etc. 2000 w. Surveyor—Nov. 20, 1908. No. 728 A.

Tests of Plain and Reinforced Concrete Columns. M. O. Whitney. Read before the Am. Soc. for Test. Met. Illustrated report of tests made in the laboratory at the Univ. of Wisconsin during the past year. 3500 w. Eng Rec—July 10, 1909. No. 6254.

A Test of Three Large Reinforced Concrete Beams. Arthur N. Talbot. Describes the slabs and method of testing, and gives data. Ills. 5000 w. Univ of Ills, Bul 28—Oct. 5, 1909. No. 3931 N.

Reinforced Concrete Columns. W. Noble Twelvetrees. The present article discusses Prof. Talbot's tests. 2500 w. Engng—Sept. 10, 1909. Serial. 1st part. No. 7863 A.

MATERIALS OF CONSTRUCTION

Reinforced Concrete

Emperger's Tests on Reinforced Concrete Columns (Empergers Versuche mit betoneisernen Säulen). Max R. v. Thullie. Summarizes and discusses the results of Recent Tests by Fritz von Emperger. Ills. 4500 w. Zeitschr d Oest Ing u Arch Ver—Dec. 18, 1908. No. 1981 D.

Column Tests of Sachs & Pohlmann, Hamburg (Säulenversuche von M. Sachs & Pohlmann, Hamburg). Gives the results. Ills. Serial, 1st part. 2000 w. Beton u Eisen—Jan. 28, 1909. No. 2821 E.

Rupture Tests of Reinforced Concrete Beams by N. Rella and Neffe. Vienna (Die Bruchversuche mit Plattenbalken der Betonbauunternehmung N. Rella und Neffe, Wien). Describes tests on T beams, reinforced in various ways, and gives results. Ills. 3750 w. Beton u Eisen—Feb. 23, 1909. No. 3553 F.

Tests on Reinforced Concrete Beams. E. Brown. Gives results of tests made at McGill University, during 1906-07. Ills. 20000 w. Can Soc of Civ Engrs—Oct. 15, 1908. No. 285 N.

Some Results of Recent Reinforced-Concrete Tests Made by the Firm of Dyckerhoff and Widmann (Einige Ergebnisse neuerer Eisenbeton-Versuche der Firma Dyckerhoff & Widmann A.-G.) W. Luft. Reports tests on beams. Ills. Serial. 1st part. 2200 w. Deutscher Bau—Oct. 14, 1908. No. 559 B.

Results of Tests of Deflection of Reinforced Concrete T-Beams. A. B. White. A portion of a graduation thesis on tests made at Swarthmore College. 1200 w. Engng-Con—May 12, 1909. No. 4655.

Tests of Reinforced Concrete Beams. Resistance to Web Stresses. Series of 1907 and 1908. Arthur N. Talbot. An account of investigations made and information gained. 20000 w. Univ of Ill, Bul 29—Jan. 4, 1909. No. 4755 N.

The Strength of Thin Reinforced Concrete Columns (Sur la Résistance au Flambage des Poteaux en Béton armé). M. Mesnager. Results of tests. Ills. 5600 w. Ann d Ponts et Chaussées—1909-II. No. 5717 E + F.

The Ability of Reinforced Concrete to Sustain Great Elongations. A communication by M. Considere to the French Academy of Sciences, translated from No. 5 of its *Comptes Rendus*. Experimental investigations. 1200 w. Cement—July, 1909. No. 6741 C.

Compression Tests of Concrete Reinforced by Nails. Leon S. Moisseiff. Abstract of a paper before the Am. Soc. for Test. Met. Explains the practical

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Reinforced Concrete

need of this material and the results of investigations. 1500 w. Engng-Con—July 14, 1909. No. 6329.

Tests of Bond of Steel Bars Embedded in Concrete. H. C. Berry. Read before the Am. Soc. for Test. Mat. Describes tests made by various methods and results. 2000 w. Eng Rec—July 24, 1909. No. 6646.

Tests on Bond Between Steel and Concrete. H. C. Berry. A report of tests made to determine the change in bond strength as age increased for specimens stored in air and in water, and to compare the bond strength of different forms. 1200 w. Eng Rec—Sept. 4, 1909. No. 7561.

Compression Tests of the French Government Commission. Leon S. Moisseiff. Describes the compression tests on longitudinally reinforced columns. Ills. 2500 w. Cement—May, 1909. No. 5556 C.

The Corrosion of Steel Reinforcement in Concrete. Ernest R. Matthews. Describes experiments in connection with the rusting of steel in concrete, explaining in detail the tests made by the writer, and stating conclusions. 4500 w. Soc of Engrs—April 5, 1909. No. 4002 N.

The Effect of Repeated Stress on the Bond between Concrete and Clean and Rusted Iron (Einfluss wiederholter Beanspruchung auf die Haftfestigkeit von Beton an Eisen mit reiner und verrosteter Oberfläche). Bernh. Kirsch. Results of tests. 2400 w. Oest Wochenschr f d Oeffent Baudienst—April 24, 1909. No. 4894 D.

Electrolysis of Reinforced Concrete. A. S. Langsdorf. Describes experiments made to determine the electrolytic behavior of reinforced concrete. Ills. 1000 w. Jour Assn of Engng Socs—Feb., 1909. No. 3961 C.

See also Concrete, under MATERIALS OF CONSTRUCTION.

Steel.

Nickel Steel for Bridges. Discussion of paper by J. A. L. Waddell. 6000 w. Pro. Am Soc of Civ Engrs—Dec., 1908. No. 1357 E.

Nickel Steel for Bridges. R. E. Chadwick. A review of J. A. L. Waddell's paper on this subject. 2500 w. Can Engr—Jan. 15, 1909. No. 1772.

Economic Study of the Use of High-Tension Carbon Steel for Bridges (Etude économique de l'Emploi de l'Acier au Carbone à grande Résistance, pour la Construction des Ponts). J. A. L. Waddell. A reply to criticisms of the author's paper on "Nickel Steel for Bridges." Ills.

MATERIALS OF CONSTRUCTION

Steel Preservation

4500 w. Génie Civil—Aug. 7, 1909. No. 7933 D.

The Growth of the Angle Bar. M'Leod Thomson. Illustrated review of development and progress giving some new patterns thought to embody the most recent ideas. 2500 w. R R Age Gaz—Nov. 6, 1908. No. 127.

Steel Work. C. V. Childs. Remarks on the influence of steel as a building material, tracing the development of steel frame buildings. 1800 w. Archt, Lond—Jan. 8, 1909. Serial, 1st part. No. 1798 A.

Tests of Built-Up Steel and Wrought-Iron Compression Pieces. Arthur N. Talbot and Herbert F. Moore. Describes tests giving observations on the results. Ills. 9800 w. Pro Am Soc of Civ Engrs—April, 1909. No. 4335 E.

Some Experiments on Solid Steel Bars Under Combined Stress. C. Alfred Smith. Compares results of different tests made to determine the cause of elastic failure of ductile materials, attempting to reconcile divergent data. 4000 w. Engng—Aug. 20, 1909. No. 7441 A.

The Condition of the Steel Work in a San Francisco Building Erected 13 Years Ago. Frank B. Gilbreth. Reports the conditions of steel work in the Mutual Life Insurance Co.'s building after being subject to earthquake and fire, and the conclusions drawn. 1500 w. Cement—June, 1909. No. 6376 C.

Tests of the Stability of Steel Construction (Zweiter Bericht über Festigkeitsversuche mit Eisenkonstruktionen). Report of the Testing Committee of the German Steel Contractors' Assn., on the strength of rivetted joints. Ills. 5000 w. Zeitschr d Ver Deutscher Ing—June 26, 1909. No. 6731 D.

The Slipping Resistance of Nickel Steel Rivets (Die Festigkeit von Nickelstahlnieten unter besonderer Berücksichtigung des Gleitwiderstandes). E. Preuss. Results of experiments. Ills. 2700 w. Stahl u Eisen—July 28, 1909. No. 7265 D.

See also Blackwell's Island, under BRIDGES.

Steel Corrosion.

See Steel, under BRIDGES.

Steel Preservation.

The Preservation of Iron and Steel. Allerton S. Cushman. Read before the I. and S. Inst. Examines the controlling factors that influence the causes and the cure of the corrosion of iron, and the possible bearing of the results of recent research. Also discussion. Ills. 17000 w. Ir & Coal Trds Rev—May 14, 1909. No. 5132 A.

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Steel Sections

MATERIALS OF CONSTRUCTION

Timber Preservation

Steel Sections.

Test of Standard and Wide-Flange I-Beams. Edgar Marburg. Abstract of paper before the Am. Soc. for Test. Mat., with editorial note. Reports results of tests to determine the strength and behavior, and a comparison between standard and wide-flange beams. Ills. 3800 w. Eng News—Aug. 12, 1909. No. 7051.

Steel Specifications.

New Specifications for Shapes, Plates and Rails. Gives the changes recommended by committee A of the American Society for Testing Materials. 4500 w. Ir Age—July 1, 1909. No. 6063.

Stone.

See Concrete, under MATERIALS OF CONSTRUCTION.

Stone Preservatives.

Means of Preserving Natural Stone against Disintegration (Ueber Konservierungsmittel zum Schutze der aus natürlichem Gestein aufgeführten Bau- und Bildwerke gegen Verwitterung). Max Setz. Describes briefly various methods. 2800 w. Oest Wochenschr f d Oeffent Baudienst—July 3, 1909. No. 7454 D.

Stucco.

Mortars for Stucco and Methods of Applying and Finishing Stucco. Gives precautions that should be observed to secure good work. 2500 w. Engng-Con—Aug. 11, 1909. No. 7003.

Terra Cotta.

See Fireproof, under CONSTRUCTION; and Brick, under MATERIALS OF CONSTRUCTION.

Timber.

Forest Conservation. R. S. Kellogg. Timber production and its proper handling and related matters. General discussion. 7000 w. Jour N Eng W-Wks Assn—Dec., 1908. No. 1881 F.

Improved Methods of Bleeding Pine Trees for Turpentine and Rosin. A description of old and new methods, and report of U. S. Forest Service tests of the natural and bled timber. Ills. 700 w. Eng News—March 18, 1909. No. 3243.

Specifying and Inspecting Lumber. From comment by W. F. Goltra, on the paper read by J. M. McCarthy before the Ry. Storekeepers' Assn. Urges the adoption of the standard rules of the manufacturers, and inspection at the mill or shipping point. 1000 w. R. R. Age Gaz—July 23, 1909. No. 6632.

Standard Specifications for Grading Structural Timber. Data from a report of

a committee to the Am. Soc. of Test. Mat. 2500 w. Eng Rec—Aug. 7, 1909. No. 6948.

Properties of the Usual Sections of Timber. George M. Adams. Read before the Transvaal Inst. of Mech. Engrs. Gives tabulated results of calculations explaining applications. 700 w. Mech Engr—March 12, 1909. No. 3410 A.

Woodwork. E. Guy Dawber. A lecture on the historical growth of design in woodwork. 1400 w. Archt, Lond—Feb. 5, 1909. Serial, 1st part. No. 2474 A.

Crushing Tests on Water-Soaked Timbers. Edward C. Sherman. Brief report of tests. 500 w. Eng News—July 1, 1909. No. 6088.

Experiments on the Crushing Strength of Timber (Het Indrukken van Paalkoppen in Kespen). M. E. H. Tjaden. Gives detailed results of elaborate tests. Ills. 8000 w. De Ingenieur—Sept. 11, 1909. No. 8920 D.

An Analysis of Canada's Timber Wealth. Abstract of a study by B. E. Fernow. Information concerning the timber areas and their value. 5500 w. Can Engr—Dec. 4, 1908. No. 843.

Afforestation and Timber-Planting in Great Britain and Ireland. Dr. J. Nisbet. Reviews the work of British Commissions appointed to deal with this question, explains the present situation, and discusses the possibilities. General discussion. 10,000 w. Jour Soc of Arts—March 26, 1909. No. 3771 A.

Re-Afforestation. Editorial discussion of this question with special reference to the United Kingdom. 1700 w. Engng—Jan. 29, 1909. No. 2363 A.

See also Concrete, under MATERIALS OF CONSTRUCTION.

Timber Preservation.

A Primer of Wood Preservation. W. F. Sherfese. Considers decay and how it can be retarded; and preservatives and processes used in the United States. 6000 w. U S Dept of Agri, Circ. 139—Feb. 8, 1908. No. 477 N.

Preservation of Timber. F. H. Mason. General remarks, with details of the creosoting plant at Norfolk, Virginia. 4500 w. Min & Sci Pr—Dec. 19, 1908. No. 1260.

A Comparison of the Various Processes of Preserving Timber. G. B. Shipley. Seven processes are described and information given of the equipment for timber-treating plants, their cost, etc. Ills. 5000 w. Eng News—Oct. 14, 1909. No. 8563.

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Timber Preservation

Wood Preservation. Report of Committee No. XVII of the American Railway Engineering and Maintenance of Way Association. 17000 w. Ills. Bul Int Ry Cong—May, 1909. No. 5684 G.

The Preservation of Mine Timbers. John M. Nelson. Abstract of paper read before the Coal Min. Inst. of America. Brief remarks on the best methods of prolonging the life of timbers. Ills. 1600 w. Eng & Min Jour—July 31, 1909. No. 6791.

Difficulties in the Practical Work of Creosoting Timber. John C. Oakes. Describes the Bethel dead oil of coal tar process, and refers to other processes. 6000 w. Eng News—Sept. 2, 1909. No. 7541.

Wood Preservation by the Open Tank Process. Ernest F. Hartmann. Suggestions for the proper treatment of timber, describing the process named. Ills. 4000 w. Eng News—Dec. 31, 1909. No. 1405.

The Relation of Non-Pressure Processes of Wood Preservation to Pressure Processes. W. F. Sherfese. Shows that the non-pressure simplifies both the processes and the mechanical equipment, and that they do not compete with the pressure processes. Ills. 3300 w. Eng News—March 4, 1909. No. 2994.

A Timber Treating Plant at Madison, Illinois. Illustrated description of a timber-creosoting plant and the methods used. 3500 w. Eng Rec—Aug. 7, 1909. No. 6953.

MEASUREMENT

Cement Testing

A Modern Timber Treating Plant. Illustrated description of the plant of the Santa Fé at Somerville, Texas, for treating ties by Rueping process. 2000 w. Met Work—March 20, 1909. No. 3258.

Tie Treatment with Crude Oil on the Mexican Central. Describes the process used at Aguascalientes, Mexico, giving experimental results. 2000 w. R R Age Gaz—March 26, 1909. No. 3518.

The Preservative Treatment of Timbers Used by Electric Traction Companies. J. M. Nelson. Read at meeting of Cent. Elec. Ry. Assn. Considers the causes of decay and the principles of its prevention, illustrating wood-preserving plants. 3500 w. Elec Ry Jour—April 3, 1909. No. 3668.

The Strength of Treated Mine Timbers (Ueber die Eigenschaften imprägnierter Grubenhölzer, insbesondere über ihre Festigkeit). D. Stens. Gives results of tests on various woods treated with various preservatives. 4200 w. Glückauf—March 6, 1909. No. 4261 D.

The Preservative Treatment of Timber (Traitement antiseptique des Bois). J. Vinsonneau. Describes the Nestor Marchal process for the treatment of soft, tropical woods. Ills. 2000 w. Rev Indus—May 1, 1909. No. 5735 D.

Trass.

See Mortar, under MATERIALS OF CONSTRUCTION.

MEASUREMENT

Asphalt Testing.

Asphalt-Testing — Penetration. Harry Tipper. Recommends a limit of variation in penetrations at different temperatures. 1200 w. Munic Jour & Engr—Jan. 6, 1909. No. 1489.

Testing Asphalt—Melting Point and Flow Point. Henry Tipper. Considers the value of these tests. 2800 w. Munic Jour and Engr—March 3, 1909. No. 2933.

Base Lines.

Determination of the Length of Geodetic Base Lines by Trigonometry (Trigonometrische Längenbestimmung geodätischer Grundlinien). A. Tichy. A complete demonstration of the methods. Ills. Serial, 1st part. 3300 w. Zeitschr d Oest Ing u Arch Ver—Jan. 1, 1909. No. 2811 D.

Cement Testing.

Free Lime in Portland Cement. Alfred H. White. Describes a simple microscopic test for free lime and discusses

the result of its application to a number of cements. Ills. 3500 w. Jour Ind & Engng Chem—Jan., 1909. No. 2038 E.

The Importance and Cost of Cement Testing. W. Purves Taylor. Read before the Nat. Assn. of Cement Users. Shows the value of well-made tests, and the danger of cheaply made tests. 1500 w. Cement—Feb., 1909. No. 3003 C.

Progress Report of Special Committee on Uniform Tests of Cement. Illustrates and describes experimental investigations. 4000 w. Pro Am Soc of Civ Engrs—Feb., 1909. No. 3456 E.

Testing the Compressive Strength of Portland Cement (Prüfung der Druckfestigkeit von Portlandzement). A. Martens. Describes apparatus and methods. Ills. 2000 w. Zeitschr d Ver Deutscher Ing—May 1, 1909. No. 5958 D.

Portland Cement: The Le Chatelier Test for Soundness. Arthur Charles Davis. Reports results of tests on the

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Clay Products Testing

expansion of cements and conclusions. 2500 w. Inst of Civ Engrs—No. 3777. No. 6451 N.

Progress in Methods of Testing Hydraulic Cements. Abstract of a report by M. Feret to the recent Copenhagen Congress of the Int. Assn. for Testing Materials, on some new tests proposed. 2500 w. Eng Rec—Oct. 2, 1909. No. 8235.

Measuring the Hardness of Cements by the Ball Method (Essai de Dureté des Chaux et Ciments par la Méthode de la Bille). M. Laborbe. Discusses the ball indentation test as applied to hydraulic mortars. Ills. 5500 w. Rev de Métal—Sept., 1909. No. 8608 E + F.

See also same title, under MATERIALS OF CONSTRUCTION.

Clay-Products Testing.

Testing Clay Products. A. V. Bleininger. Gives an outline of tests to be made at Pittsburg laboratories to determine their fire-resisting properties. 1600 w. Ins Eng—March, 1909. No. 3500 C.

Concrete Testing.

Specifications for Test Specimens of Concrete to be Immersed in Sea Water by the United States Navy Department. Specifications drawn for guidance in conducting a series of tests under government supervision at the Navy Yard at Charlestown, Mass. 1500 w. Engng-Con—Dec. 30, 1908. No. 1452.

A New Test for Concrete. J. S. Owens. Describes the origin and application of a new test for determining the end of the mixing process in preparing concrete. 6000 w. Soc of Engrs—March 1, 1909. No. 3284 N.

See also Testing Machines, under MEASUREMENT.

Current Meters.

Current Meter Rating. Francis C. Shenehon. Describes the calibration or rating of the current measuring instrument or meter. Ills. 4500 w. Minn Engr—March, 1909. No. 4061 C.

The Use and Care of the Current Meter, as Practiced by the United States Geological Survey. John C. Hoyt. Illustrated description of the instruments and their use. 10000 w. Pro Am Soc of Civ Engrs—Aug., 1909. No. 7362 E.

The Use and Care of the Current Meter, as Practiced by the United States Geological Survey. Discussion of the paper by John C. Hoyt. Ills. 1800 w. Pro Am Soc of Civ Engrs—Oct., 1909. No. 8847 E.

MEASUREMENT

Datum Plane.

The Datum Plane. Otto Klotz. Discusses the subject from the points of view of the intellectual datum plane and the physical datum plane, referring to specific work depending on it. 7500 w. Pro Soc of Ap Sci—Session 1908-1909. No. 4094 C.

Hydrographic Surveying.

See Survey Vessels, under MARINE AND NAVAL ENGINEERING.

Latitude.

The Determination of Latitude. L. B. Stewart. Brief account of the principal methods which are adapted to the use of the surveyor's transit or the sextant, with brief reference to precise methods. 4000 w. Ap Sci—March, 1909. No. 4090 C.

Leveling.

Precise Leveling of the Coast and Geodetic Survey. Henry W. Maynard. Describes the methods used in work by the United States Government. 4000 w. Cornell Civ Engr—May, 1909. No. 4742 C.

Mensuration.

Volumes of Segments Cut from Cones: A Problem in Estimating Storage Piles. Charles A. Gilchrist. Mathematical. 1000 w. Eng News—April 29, 1909. No. 4357.

The Computation of Area. Frank J. Gray. Deals with the computation of various forms, such as rectangles, triangles, polygons, etc. 2000 w. Surveyor—Sept. 3, 1909. Serial. 1st part. No. 7737 A.

Range Finders.

The Short-Base Range-Finder and Its Principles of Construction. H. Dennis Taylor. Discusses the principles, and the difficulties, and explains a new form of construction. 2500 w. Engng—Nov. 13, 1908. Serial. 1st part. No. 441 A.

Soil Testing.

Tests of Soil for Use in Constructing and Earth Dam for a Water-Works Reservoir, Baltimore, Md. Emory Sudler. Describes method used in testing soil in the construction of a large storage reservoir, with tabulated results. 1000 w. Eng News—March 25, 1909. No. 3490.

Stream Gauging.

Stream Gaging in the West. W. B. Freeman. Gives some of the results obtained by the Hydrographic branch of the U. S. Geological Survey, describing features. Ills. 2500 w. Cornell Civ Engr—May, 1909. No. 4743 C.

The Design of Cable Stations for River Measurements. J. C. Stevens. Illustrated detailed description of the design of river-

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gaging stations where cables are required. 1800 w. Eng News—May 6, 1909. No. 4519.

The Gauging of Streams by Notch-Boards. Detailed description of methods. 2200 w. Prac Engr—June 11, 1909. Serial. 1st part. No. 5627 A.

Ratings of a Pitot Tube. E. C. Murphy. Discusses the rating of the tube used in the U. S. Geol. Survey debris investigation laboratory for the measurement of small, shallow, open streams. Ills. 800 w. Eng News—Aug. 12, 1909. No. 7054.

See also Current Meters, under MEASUREMENT.

Surveying.

A New Precise Measurement Method with Special Line Clinometers and Tape Stretchers. Describes a method of measurement and novel instruments used. 1500 w. Eng News—Dec. 24, 1908. No. 1240.

The Rectangular System of Surveying. W. A. Truesdale. Information in regard to the development of this system. 9000 w. Jour Assn of Engng Soc—Nov., 1908. No. 1342 C.

Staking Out Curves in Rough Ground. Robert Laird. Read before the Ontario Land Surveyors' Convention. Explains method used. 2000 w. Engng-Con—Nov. 25, 1908. No. 713.

Some Extensive Railroad Surveys and Their Cost per Mile. W. S. McFetridge. Gives an outline of methods and results, and the cost of surveys in West Virginia and Ohio. Maps. 5800 w. Pro Am Soc of Civ Engrs—April, 1909. No. 4334 E.

Some Extensive Railroad Surveys, and Their Cost per Mile. Discussion of the paper by W. S. McFetridge, on this subject. 4000 w. Pro Am Soc of Civ Engrs—Aug., 1909. No. 7368 E.

A Description of Four Stadia Surveys and Their Cost. Arthur W. Tidd. Describes the methods used for conducting and systematizing the work; also giving cost data and other information. 4000 w. Eng News—Oct. 21, 1909. No. 8818.

Traverse Work in Connection with the Triangulation of the Borough of the Bronx with Special Reference to Accurate Measurement with Tapes. Edward H. Holden. Describes the triangulation and measurement of distances between stations. 4900 w. Engng Contr—June 2, 1909. No. 5310.

The Topographical Survey of the City of Baltimore. Notes from a paper by Joseph W. Shirley, submitted to the Engrs.

MEASUREMENT

Testing Machines

Club of Baltimore, giving a general account of this work. 2800 w. Eng Rec—Jan. 2, 1909. No. 1424.

Phototopography, with Special Reference to the Alaskan Boundary. P. W. Greene. Describes the methods of photographic surveying and their applications. Ills. Discussion. 4500 w. Can Soc of Civ Engrs, Bul. 5—May, 1909. No. 5853 N.

Phototopography on the Alaskan Boundary Survey. Notes from a paper by P. W. Greene, before the Can. Soc. of Civ. Engrs. describing the methods employed. 3000 w. Eng Rec—Sept. 25, 1909. No. 8068.

The History of Land Measurement in England. Wilfrid Airy. A review of the early practice. 2800 w. Engng—March 12, 1909. No. 3416 A.

The Ordnance Survey. Sir Duncan Alexander Johnston. A brief historical sketch, describing how the cadastral survey of Great Britain was made, and showing how the maps are being revised. 3500 w. Surveyor—Feb. 12, 1909. Serial. 1st part. No. 2586 A.

Sketch Mapping in Southern Nigeria. L. H. L. Huddart. Read before the Inst. of Civ. Engrs. On the making of a preliminary sketch map of a little-known district. 2500 w. Min Jour—Dec. 19, 1908. Serial. 1st part. No. 1531 A.

See also same title, under MINING AND METALLURGY, MINING.

Telemeter.

A Telemeter with Micrometer Screw Adjustment. Fred Eugene Wright. Describes a simple, fairly accurate instrument. 1200 w. Am Jour of Sci—Dec., 1908. No. 777 D.

Testing Laboratories.

The Testing Laboratory of the Bureau of Sewers, Brooklyn, and Some Tests of Sewer Pipe. Describes the laboratory, its equipment and methods. Ills. 3000 w. Eng Rec—Nov. 21, 1908. No. 416.

See also same title, under MECHANICAL ENGINEERING, MEASUREMENT.

Testing Machines.

A 250-Ton Hydraulic Compression Testing Machine. James L. Davis. Illustrated description of the machine for the New York Board of Water Supply for testing concrete in compression. 1000 w. Eng News—Feb. 11, 1909. No. 2398.

A Remarkable Testing Machine. Richard L. Humphrey. Describes the 10,000,000-pound hydraulic compression testing-machine for the testing laboratories of the U. S. Geological Survey. Ills. 800 w. Ir Age—Feb. 11, 1909. No. 2389.

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Testing Machines

A 5000-Ton Testing Machine. Illustrated description of the large testing machine being built for the laboratories of the United States Geological Survey. 1500 w. *Sci Am*—July 10, 1909. No. 6240.

Special Features of a Recently Installed 600,000-lb. Universal Testing Machine. Thorsten Y. Olsen. From *Pro. Am. Soc. for Test. Materials*. Description, with illustrations, and methods of testing. 2500 w. *Sib Jour of Engng*—Feb., 1909. No. 3252 C.

Principal Features of a 1,200,000 lbs. Capacity Testing Machine. Thorsten Y. Olsen. Read before the *Am. Soc. for Test. Mat.* An illustrated description, with special reference to a new system of transmitting the pressure developed in an hydraulic cylinder to the scale beam. 2000 w. *Ir Trd Rev*—July 29, 1909. No. 6776.

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Calibration of the 2,400,000-lb. Hydraulic Testing Machine of the Phoenix Iron Co. at Phoenixville, Pa., by Comparison with the Watertown Arsenal Emery Machine. Reports results of tests. 2000 w. *Eng News*—Oct. 7, 1909. No. 8404.

Testing Methods.

New Tests for Building Construction. Guy Elliott Mitchell. Discusses the investigations of the United States government on the subject of structural materials, their economic importance, the testing machines, and materials tested. Ills. 4000 w. *Am Rev of Revs*—Aug., 1909. No. 7020 C.

Notes Regarding the Testing of Materials. W. G. Kirkaldy. Read before the *Inst. of Co. and Munic. Engrs.* Remarks on the principles involved in such tests and the more useful ones to apply to certain materials. 3500 w. *Surveyor*—July 30, 1909. No. 6968 A.

MUNICIPAL

Abattoirs.

Public Abattoirs. R. Stephan Ayling. Presents briefly the advantages and disadvantages of public slaughter-houses, and the points to be observed in a well-planned abattoir, illustrating and describing examples in France, Germany and England. General discussion. 5500 w. *Jour Roy Inst of Brit Archts*—Jan. 23, 1909. No. 2498 C.

Asphalt Plants.

Municipal Asphalt Plants. Illustrated descriptions of plants in various cities of the U. S. and Canada. 5000 w. *Munic Jour & Engr*—March 3, 1909. No. 2932.

Recent Operations of the New Orleans Municipal Asphalt Repair Plants. From a report by Capt. W. J. Hardee. 1600 w. *Eng Rec*—March 13, 1909. No. 3111.

Catch Basins.

Data on Methods and Cost of Cleaning Catch Basins, Obtained from Practice in the Cities of Boston and Worcester, Mass. Abstract of report of Metcalf & Eddy. Describes methods, giving comparative results. 1500 w. *Engng-Con*—Sept. 15, 1909. No. 7797.

Cesspools.

The Cesspool and Its Dangers. Burton J. Ashley. Read before the *Am. Soc. of Insp. of Plumb. and San. Engrs.* Shows that underground waters are often polluted and that wells are contaminated. 4500 w. *Can Engr*—Oct. 15, 1909. No. 8792.

City Building.

Building an Industrial City. Illustrated description of the development of

the residence portion of Gary, Indiana; the public utilities problems and how they were handled. 2000 w. *Ir Age*—July 1, 1909. No. 6059.

City Charters.

Charter Making and Mending in New York, Boston, and Berkeley, Cal. Gives information in regard to the proposed charters for the cities named, with editorial discussion. 15500 w. *Eng News*—March 25, 1909. No. 3494.

City Improvement.

Preparation of Plans and the Assessment of Betterments in Boston, and the Laws Governing the Same. Frank O. Whitney. Reviews changes since 1891, and discusses the working of the laws relating to the laying out of streets and assessment of betterments. 1500 w. *Jour Assn of Engng Socs*—Aug., 1909. No. 8062 C.

City Planning.

Improvement of Town Suburbs. George Cowan. Presents the need of town planning, discussing some of the difficulties and problems. 3000 w. *Surveyor*—Feb. 19, 1909. No. 2884 A.

The Future Prince Rupert as Conceived by the Landscape Architects. George D. Hall. Plans and illustrated description of the Pacific terminal city of the Grand Trunk Pacific Railway, as designed. 3000 w. *Archit Rec*—Aug., 1909. No. 6754 C.

The New Capital for Australia. Information concerning the site selected, treat-

CIVIL ENGINEERING

Drainage

ing it from the topographical, engineering and related points of view. 3000 w. Engr, Lond—Jan. 8, 1909. No. 1823 A.

Drainage.

Hydraulic Diagrams. D. D. Bleich. Presents data and diagrams to facilitate computations of run-off and pipe flow. 2500 w. Sch of Mines Qr—Nov., 1908. No. 974 D.

Methods and Cost of Drainage Work in Illinois. Abstract from report of Committee on Drainage, Ills. Soc. of Engrs. & Surv. Ills. 7000 w. Engng-Con—Oct. 13, 1909. No. 8553.

Experimental Data on Methods and Costs of Draining Irrigated Lands. Plans and description of the draining of Geary farm, Huntington, Utah, and also other work done, showing differences in countries having an underflow, and those underlaid with bog land. 4500 w. Engng-Con—Oct. 20, 1909. No. 8795.

An Additive Method of Computing Run-Off to Sewers. Carl H. Nordell. Read before the Munic. Engrs. of the City of N. Y. Reviews briefly various methods developed, and gives a detailed description of the additive method. Diagrams. 4500 w. Eng News—March 11, 1909. No. 3102.

Relation of Portland Cement to Iowa's Drainage Development. A. O. Anderson. Read before the Iowa Assn. of Cement Users. Reports tests made of cement tile, showing their reliability. 1500 w. Cement Age—March, 1909. No. 3449.

The Main Drainage of London. Abstract of a report prepared for the London County Council by Maurice Fitzmaurice, giving the history of drainage systems in London as early as the reign of Henry III. 1400 w. Engr—May 28, 1909. No. 5266 A.

Drainage Interceptor Traps and Ventilation. S. E. Burgess. Paper and discussion before the Inst. of Co. & Munic. Engrs. An explanation of the author's views and practice. 5500 w. Surveyor—July 2, 1909. No. 6297 A.

The Storm Drainage of Pretoria. H. D. Badcock. Describes the situation and conditions, and the means taken to prevent flooding. 1200 w. Engr, Lond—Jan 15, 1909. No. 2083 A.

The Design of Drainage Canals and Pipe Lines (Zahlenbeispiele zum Berechnen von Rohrleitungen und Kanälen für Entwässerungsanlagen). Adolf Ståding. Mathematical solution of several common problems. Ills. Serial, 1st part. 6500 w. Gesundheits-Ing—April 17, 1909. No. 4888 D.

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Municipal Engineering

Experiences in Working Separate Drainage Canals (Ueber Erfahrungen im Betriebe getrennter Entwässerungskanäle). H. Metzger. Compares the operation of separate storm-water and sewerage systems with the combined system. 3000 w. Gesundheits-Ing—April 17, 1909. No. 4887 D.

A Note on the Design of Storm-Water Drainage Sewers (Beitrag zur Berechnung von Ueberfällen bei Regenauslässen). Prof. Frühling. A mathematical discussion. Ills. 4000 w. Gesundheits-Ing—Feb. 6, 1909. No. 3387 D.

Critical Canal Profiles (Kritische Kanalgefälle). Franz Schmidt. Discusses the design of drainage canals to prevent accumulations of sediment. Ills. 2300 w. Gesundheits-Ing—May 22, 1909. No. 5798 D.

The Formation of Sulphuric Acid in Nature and Some of its Effects on Drainage and Water Supply Problems (Bildung von Schwefelsäure in der Natur und einige Folgerscheinungen namentlich auf dem Gebiete der Städteentwässerung und Wasserversorgung). Herr Bredtschneider. Discusses its effects on structural materials. Serial, 1st part. 7000 w. Gesundheits-Ing—May 1, 1909. No. 5796 D.

Method of Taking Care of Surface Run-off at the Villagrazia Magazine, Palermo (Sistemazione delle Acque piovane nella Polveriera di Villagrazia, Palermo, e Studio di un Pozzo assorbente). Alessandro Migliozi. Describes the problem and its solution by a drainage system. Mathematical. Ills. 3300 w. Monit Tech—July 30, 1909. No. 7239 D.

The Hauff Graphical Method of Designing Drainage Canals (Die graphische Berechnung städt. Kanalnetze nach Ingenieur Hauff). Maximilian Vicari. Demonstration of method of designing storm-water sewers. Ills. 2500 w. Gesundheits-Ing—Aug. 21, 1909. No. 7982 D.

See also Reclamation under CONSTRUCTION; Sewers and Street Grading, under MUNICIPAL; Purification, under WATER SUPPLY; and Canals, under WATERWAYS AND HARBORS.

Garbage Disposal.

See Refuse Disposal.

Malvern, England.

Works of a Municipal Nature in Malvern, Eng. William Osborne Thorp. Illustrates and describes the various undertakings. 6000 w. Surveyor—June 4, 1909. Serial. 1st part. No. 5514 A.

Municipal Engineering.

The Municipal Engineer: His Duties and Responsibilities. F. J. Edge. Presi-

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Pavements

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dential address before the Newcastle-on-Tyne Assn. of Students of the Inst. of Civil Engrs. 3500 w. Surveyor—Nov. 20, 1908. No. 729 A.

Inaugural Address of the President. Edward John Silcock. Introductory remarks, followed by a review of matters relating to municipal engineering. 10500 w. Soc of Engrs—Feb. 1, 1909. No. 2713 N.

Pavements.

Roads and Streets. Louis C. Kelsey. Reviews briefly the various pavements used, their construction and maintenance. 2500 w. Jour Assn of Engng Socs—Oct., 1908. No. 782 C.

The Proper Construction of Brick Street Pavements. Will P. Blair. Read before the Am. Soc. of Munic. Imp. Points out the essentials of good brick pavements. 5000 w. Munic Engng—Nov., 1908. No. 345 C.

Old and New Methods of Asphalt Paving. Guy B. Grant. A comparison of work done in Omaha, Neb., in 1882, with present-day methods. 2000 w. Munic Engng—Dec., 1908. No. 785 C.

Street Pavements. George C. Powell. Gives details regarding pavements suitable for city traffic. Ills. 2500 w. Can Engr—Jan. 29, 1909. No. 2169.

A Review of Chicago Paving Practice. P. E. Green. A review of types of street pavement laid, the methods of construction, wearing qualities, etc. Ills. 12500 w. Pro Am Soc of Civ Engrs—Aug., 1909. No. 7365 E.

A Review of Chicago Paving Practice. Discussion of the paper by P. E. Green. 5800 w. Pro Am Soc Civ Engrs—Oct., 1909. No. 8849 E.

Some Experiments on the Resistance of Pavements. A. C. D. Blanchard. An account of experiments in Toronto to show the influence of heavy grades on the resistance to tractive effort, giving results. Ills. 1000 w. Can Soc of Civ Engrs—April 29, 1909. No. 4552 N.

The Construction of an Asphalt Street. Isaac Van Trump. From an address at the Univ. of Notre Dame, Ind. Describes the methods of construction. 1500 w. Munic Engng—April, 1909. No. 3819 C.

Causes and Prevention of Defects in Asphalt Pavements. Isaac Van Trump. From an address at Notre Dame Univ., Ind. Discusses the main causes, showing that many are under the control of the municipal engineer. 1200 w. Munic Engng—May, 1909. No. 4551 C.

Asphalt Paving Mixtures. L. Kirschbraun. On points relating to the con-

struction and the materials necessary to produce a good pavement. 1800 w. Munic Engng—Oct., 1909. No. 8508 C.

Portable Machines for Making Asphaltic Concrete Paving. Illustrates and describes these machines and gives an account of work in Chicago. 5000 w. Eng News—Oct. 21, 1909. No. 8820.

Amount and Cost of Repairs to Asphalt Pavements at Syracuse, N. Y., and Proper Method of Determining Time for Ceasing Repairs and Renewing. From the annual report of the City Engineer, H. C. Allen. 1200 w. Engng-Con—March 3, 1909. No. 3025.

The Value of Carbene Requirement in Asphalt Specifications. L. Kirschbaum. An investigation made to determine the value of the carbene test. 2000 w. Munic Engng—Dec., 1908. No. 784 C.

Creosoted Wood Block Pavements. Abstracts of two papers on this subject before the convention of the Illinois Soc. of Engrs. & Surveyors. 2500 w. Eng News—Feb. 18, 1909. No. 2521.

Notes on Wood Block Paving. Malcolm B. Bennett. Considers details of construction. 3500 w. Surveyor—July 16, 1909. No. 6664 A.

The Petrolithic Pavement. D. Lee Wardroper. Describes this system of road construction and the use of the roller tamper. 1800 w. Eng News—July 29, 1909. No. 6773.

Unsatisfactory Experience with Petro-lithic Pavements at El Paso, Tex., and Los Angeles, Cal. A letter from J. L. Campbell, and reports from cities named. Ills. 6000 w. Eng News—Sept. 23, 1909. No. 8017.

The Mineral Rubber Pavement. Linn White. Read before the Am. Soc. of Munic. Imp. Describes this form of pavement and states the advantages claimed for it. 2000 w. Munic Engng—Dec., 1908. No. 787 C.

The Blome Concrete Pavement. Harry S. Dewey. Read before the Am. Soc. of Munic. Imp. Describes this system of granitoid concrete blocked pavement. 2200 w. Munic Engng—Dec., 1908. No. 786 G.

Mosaic Pavements (Pavimenti e Rivestimenti a Mosaico). Discusses pavements of artificial stone, the manufacture of the blocks, construction of the pavement, etc. Ills. Serial. 1st part. 2500 w. Il Cemento—Jan. 15, 1909. No. 2653 D.

Cement Sidewalks. Discusses materials and methods of construction. Ills. 1600 w. Munic Jour & Engr—Nov. 4, 1908. No. 84.

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Public Baths

Brick Paving and Street Railway Track Construction at Champaign, Ill. Particulars from a paper by G. C. Fairclo, read before the Ill. Soc. of Engrs. and Survs. Ills. 1500 w. Eng News—March 18, 1909. No. 3241.

The Detailed Cost of Constructing 19,067 sq. yds. of Belgian Block Pavement at Baltimore, Md. Describes work and gives itemized costs. 2000 w. Engng-Con—Sept. 22, 1909. No. 8009.

Machinery for the Maintenance of Street Pavements in Paris. Jacques Boyer. Reviews the latest developments in methods and machines for pavement construction and repair, and for street cleaning. Ills. 4000 w. Engineering Magazine—April, 1909. No. 3526 B.

See also Asphalt, and Paving Brick, under MATERIALS OF CONSTRUCTION; Asphalt Plants, under MUNICIPAL; and Asphalt Testing, under MEASUREMENT.

Public Baths.

Public Baths. Jno. K. Allen. Illustrated detailed descriptions of modern public baths in America, with information relating to them. 5500 w. Dom Engng—May 22, 1909. No. 4975.

Public Baths in School House Basements. Reuben S. Bemis. Brief illustrated outline for bath-house plan. 800 w. Dom Engng—May 22, 1909. No. 4976.

New Municipal Bath at Milan (Nuovo Bagno municipale a Milano al Ponte delle Gabelle). Describes a large modern installation. Ills. 3000 w. Monit Tech—June 30, 1909. No. 6553 D.

The Wiesbaden Public Baths (Entwicklung und Betrieb der Volksbadeanstalten in Wiesbaden). B. Berlit. Describes the buildings, their equipment, etc. 8000 w. Gesundheits-Ing—Feb. 20, 1909. No. 3390 D.

Refuse Destructors.

Devices for Charging Refuse into High Temperature Refuse Incinerators. Samuel A. Greeley. An illustrated article showing the respective features of hand-charged and mechanically-charged incinerators of the high-temperature type. Compares their cleanliness, construction, operation, efficiency and cost. 8000 w. Eng News—Aug. 26, 1909. No. 7357.

Refuse Disposal.

City Refuse and Its Disposal. H. deB. Parsons. Brief discussion of methods. 2500 w. Cal Jour of Tech—Oct., 1908. No. 344.

City Refuse and Its Disposal. H. deB. Parsons. Lecture at Rensselaer Poly. Inst. Gives a general classification of

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waste materials discussing their collection, methods of disposal and related subjects. 6000 w. Engng-Con—Sept. 1, 1909. No. 7518.

The Design and Working of a Modern Destructor. William F. Loveday. Read before the Incor. Assn. of Munic. and Co. Engrs. Considers recent development and progress, giving the working and results. General discussion. 7500 w. Surveyor—April 9, 1909. No. 4027 A.

Electricity Works and Refuse Destructors. J. A. Robertson. Abstract of paper before the Glasgow Sec. Aims to show the benefits from the combination of electricity works and refuse destructors under certain conditions. 4000 w. Elec Engr, Lond—April 16, 1909. No. 4190 A.

Electricity Works and Refuse Destructors. J. A. Robertson. Abstract of paper before the Glasgow Sec. of the Inst. of Elec. Engrs. Deals with the nature of the problem, the most important points in destructor design, and gives results at Greenock. 5500 w. Elect'n, Lond—April 23, 1909. No. 4450 A.

Utilization and Incineration of Household Refuse (Utilization et Incinération des Ordures Ménagères). Emile Burelle. Reviews methods of collection, transportation and utilization or destruction. Ills. 4000 w. Rev d'Econ Indus—Oct. 16, 1908. No. 507 D.

Garbage Incineration and Garbage Destructors (Note sur l'Incinération et sur les "Destructeurs" d'Ordures ménagères). E. Damour. Discusses the qualities required in an incinerator. 2500 w. Bul Soc d'Encour—April, 1909. No. 4867 G.

The Economy of Refuse Destructors (Over vuilnisverbrandingsovens en daarmee te verkrijgen uitkomsten). J. C. H. Fischer. Gives results in England and on the Continent. Ills. 8000 w. De Ingenieur—April 17, 1909. No. 5081 D.

Tests in Burning Various Kinds of Refuse in the Dörr Destructor (Verbrennungsversuche mit verschiedenen Müllarten im Dörrschen Müllverbrennungsofen). Gives results of tests. 3300 w. Gesundheits-Ing—Oct. 17, 1908. No. 587 D.

A New Refuse Destructor for West New Brighton, Borough of Richmond, New York City. Gives an official report by J. T. Featherston of a destructor recently put in operation. Ills. 3000 w. Eng News—Nov. 5, 1908. No. 98.

Operating Results of the Buffalo Refuse Utilization Plant. Illustrates and describes a successful plant and its operation. 2000 w. Eng Rec—Nov. 7, 1908. No. 141.

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Refuse Disposal

Garbage Incineration in Scranton. Describes two incinerators recently completed, the new system of garbage collection, giving cost of operation. 2200 w. *Munic Jour & Engr*—Feb. 3, 1909. No. 2234.

The Garbage Crematory of the Newport Naval Training Station. R. E. Bakenhus. Illustrates and describes this successful plant at Newport, R. I. 2500 w. *Eng Rec*—Feb. 20, 1909. No. 2569.

Specifications and Bids for an Incinerating and Power Generating Plant for Milwaukee, Wis. Information in regard to this plant, with specifications and editorial. 4500 w. *Eng News*—April 22, 1909. No. 4164.

The New Garbage Reduction Plant at St. Louis. Very extensive works to handle the entire garbage output of the city, and to reclaim by-products, are illustrated and described. 4000 w. *Eng Rec*—July 3, 1909. No. 6176.

The Utilization and Disposal of Destructor Clinker. E. R. Sutcliffe. Gives suggestions as to how this material may be disposed of to the best advantage. Ills. 3000 w. *Surveyor*—March 26, 1909. No. 3781 A.

Acton Refuse Destructor. C. J. Yorath. Illustrated detailed description of a plant for a rapidly growing district. 3500 w. *Surveyor*—March 5, 1909. No. 3158 A.

The Edinburgh Corporation's Cleaning Department. G. A. D. Mackay. An account of methods of collecting and disposing of waste, the cost, and matters related. 3500 w. *Pub Works*—Oct-Dec, 1908. No. 3594 B.

See also Central Stations, under ELECTRICAL ENGINEERING, GENERATING STATIONS.

Roads.

What the World's Roads Congress Deducted. W. F. Bradley. A review of the discussions and opinions advanced. Ills. 2200 w. *Automobile*—Nov. 5, 1908. No. 116.

Report on the Recent First International Road Congress. Nelson P. Lewis. Condensed report made to the Board of Estimate and Apportionment of the City of New York, summing the information acquired by the American delegates. 8800 w. *Eng News*—Jan. 21, 1909. No. 1873.

The First International Road Congress at Paris in October, 1908; What Led Up to It; Its Deliberations; and Its Results. Austin B. Fletcher. Relates mostly to macadam roads and motor vehicles. Ills. 12500 w. *Jour Assn of Engng Socs*—April, 1909. No. 5841 C.

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The Road Congress (Le Congrès de la Route). A. Loreau. A report of the proceedings of the International Highway Congress with the text of the resolutions and conclusions 7000 w. *Mem Soc Ing Civ de France*—Nov., 1908. No. 2601 G.

The First International Highway Congress (Le premier Congrès international de la Route.) M. Le Gavrian. A review of the proceedings and the work accomplished. 11000 w. *Ann d Ponts et Chauss*—1908-V. No. 2609 E + F.

A Third International Road Congress. Report of the conference at Seattle. The present article gives Andrew Rinker's paper on "Creosoted Wood Block Street Paving," and extract from address of A. W. Campbell on "Road Improvement in Ontario, Canada." 6500 w. *Surveyor*—Sept. 10, 1909. Serial. 1st part. No. 7848 A.

Highway Engineering in Schools and Colleges. Logan Wallace Page. Read before the Soc. for the Pro. of Engng. Ed. Suggestions for instruction in building and maintenance of roads. 1800 w. *Engng-Con*—July 21, 1909. No. 6610.

Unnecessary Width of Country Roads and City Streets. Editorial discussion called forth by report of Robert J. Thompson concerning German practice. 1500 w. *Eng News*—July, 1909. No. 6620.

The Future Road; Its Wearing Surface. Philip W. Henry. Read before the Int. Road Cong. Mainly a discussion of bituminous cement as a wearing surface. 3500 w. *Eng Rec*—Oct. 31, 1908. No. 22.

Concave v. Convex Roads. Harold Turner. Examines the advantages and disadvantages of both formations. 2500 w. *Surveyor*—April 16, 1909. No. 4197 A.

Good Roads in the South. Joseph Hyde Pratt. An account of what is being done in road construction. 3500 w. *Mfrs' Rec*—Jan. 7, 1909. (Special No.) No. 1565 C.

Road Building by the United States in Cuba. William Atherton Du Puy. An account of the macadamized roads built under the régime of the provisional governor, Charles E. Magoon. Ills. 1800 w. *Sci Am*—Feb. 13, 1909. No. 2401.

The Road Situation in the United States and Other Countries. Logan Waller Page. Read before the Nat. Road Cong. Interesting information in regard to roads and their administration and maintenance in the United States, England, France, Germany and Switzerland. 3000 w. *Eng Rec*—Oct. 2, 1909. No. 8237.

Construction and Maintenance of Roads. George A. Phillips. Read at

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Road Conference, London. An account of methods in the county of Glamorgan, Wales. 2000 w. Surveyor—May 7, 1909. No. 4710 A.

Construction and Maintenance of Roads, Wear and Tear, Etc. Albert D. Greatorex. Read at Road Conference, London. Calls attention to causes of excessive wear and tear. 2500 w. Surveyor—May 7, 1909. No. 4709 A.

Construction and Maintenance of Roads, Wear and Tear, Etc. William Nisbet Blair. Read at Road Conference, London. Brief consideration of materials, construction, etc. 2500 w. Surveyor—May 7, 1909. No. 4706 A.

Road Construction and Maintenance. R. E. B. Crompton. Claims that it is now possible to build dustless roads at no greater cost than for ordinary roads. 2500 w. Autocar—Jan. 30, 1909. No. 2340 A.

Road Maintenance. F. G. Carpenter. Read before the Road Conference, London. Discusses present conditions and difficulties and some methods of maintenance and construction. 2000 w. Surveyor—May 7, 1909. No. 4708 A.

General Figures in the Cost of Road Construction in Various Parts of the United States. Information from a report submitted by Maurice O. Eldridge to the Int. Road Congress at Paris, France. 2500 w. Engng Con—Dec. 23, 1908. No. 1290.

Road Construction and Maintenance in Gloucester County, England. Robert Phillips. Presented at the Int. Road Cong. Gives results of the experience of the writer. 3500 w. Engng-Con—Dec. 16, 1908. No. 1076.

Road Maintenance in France and Ireland. R. H. Dorman. Read before the Int. Road Cong. A comparison of roads and methods in the two countries, and suggests alterations that should be made in Irish laws relating to road maintenance. 1800 w. Surveyor—Dec. 4, 1908. No. 1011 A.

Effect of the Road Surface on Vehicles. C. S. Rolls. Read before the Int. Road Cong. Discusses improvements that would increase the life of the vehicle and the comfort of passengers. 1200 w. Surveyor—Dec. 4, 1908. No. 1012 A.

Wear and Tear of Roads. W. J. Taylor. Read at Paris Int. Road Cong. Information concerning changes in material and maintenance adopted in England, and the improvements needed. 2500 w. Surveyor—Nov. 13, 1908. No. 424 A.

Roads for Heavy Traffic. H. P. Maybury. Read before the Int. Road Cong. An account of work in the County of

Kent, England. 1200 w. Eng Rec—Nov. 28, 1908. No. 699.

Effect of Traction Engine and Heavy Motor Traffic Upon Road Foundations. R. J. Thomas. Read at Par's Int. Road Cong. Information based on the examination of various English roads. 3500 w. Surveyor—Nov. 13, 1908. No. 426 A.

Improvements in Self-Propelled Vehicles for the Reduction of Road Wear. Col. R. E. Crompton. Read before the Int. Road Cong. Discusses some points in regard to their effect on roads, such as steel studded tires, diameter of driving wheels, etc. 1200 w. Surveyor—Nov. 20, 1908. No. 727 A.

The Effect of Modern Traffic on Broken Stone Roads. L. W. Page. Read at Paris Int. Road Cong. Reports a study of this subject, giving results of tests. 2200 w. Surveyor—Nov. 13, 1908. No. 425 A.

Examination of Tars for Use on Roads. Clayton Readle and Henry P. Stevens. An experimental study with a view to determining the advantages of the different grades. 3000 w. Surveyor—Dec. 4, 1908. No. 1014 A.

Modern Road Management. E. Purnell Hooley. Read before the Int. Road Cong. Discusses the construction of roads to meet changed conditions of self-propelled traffic, favoring the tarmac road. 2200 w. Eng Rec—Nov. 7, 1908. No. 140.

Macadam Road Surfacing. Walter Wilson Crosby. Read before the Paris Int. Road Cong. Discusses the proper construction of macadam roads to meet present conditions. 2500 w. Surveyor—Nov. 27, 1908. No. 850 A.

Systems of Highway Administration Compared: Their Influence on Cost and Efficiency. W. Rees Jeffreys. A comparative examination of the highway systems in the principal countries. 3000 w. Surveyor—Dec. 11, 1908. Serial. 1st part. No. 1202 A.

Road Management and Repair. John H. Evans. Read before the Inst. of Munic. Engrs. Explains the methods adopted in the county of Hertfordshire and which have been carried out with success both in cost and results. Discussion. 5500 w. Surveyor—Jan. 22, 1909. No. 2209 A.

Comparative Maintenance Costs of Macadam and Paved Roads (Comparaison du Pavage et de l'Empierrement au Point de Vue du Prix de Revient annuel). H. Heude. A comparison of annual costs including depreciation charges. 2800 w. Ann d Ponts et Chauss—1908-V. No. 2610 E + F.

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Methods of Preventing Damage to Road Surfaces by High Speed Motor Cars. From a report by Nelson P. Lewis to the Board of Estimate and Apportionment of New York City. 3500 w. Engng-Con—Feb. 10, 1909. No. 2469.

The Theory of Economical Road and Street Design. Begins a study of the scientific method of designing a road. 1200 w. Engng-Con—April 14, 1909. Serial. 1st part. No. 3974.

The Top Soil Method of Highway Construction. C. M. Strahan. Gives methods and details of construction as applied in Georgia, reporting satisfactory results. 2000 w. Eng Rec—April 24, 1909. No. 4173.

French Roads and Roadmaking. Francis Miltoun. Information of interest, as France is noted for excellent roads. Ills. 2200 w. Autocar—April 3, 1909. Serial. 1st part. No. 3893 A.

Width of Roads and Provision of Footpaths. William Harpur. Read at Road Conference, London. Indicates the writer's views and the changes needed because of changed conditions. 2500 w. Surveyor—May 7, 1909. No. 4711 A.

Road Grades (Sulla Pendenza delle Strade ordinarie). Giulio Stabilini. A mathematical discussion of highway grades and traction. Ills. Serial, 1st part. 2500 w. Monit Tech—April 30, 1909. No. 4847 D.

Road Construction, Curves, Gradients and Camber. H. T. Wakelam. Also papers by Col. R. E. Crompton, Lord Leigh, Rev. Canon Rawnsley, and Walter J. Fletcher, with discussion. Ills. 18600 w. Surveyor—May 14, 1909. No. 4950 A.

A Practical Road Talk. Albert S. Brainard. A discussion of road construction and preservation. Ills. 3000 w. Cornell Civ Engr—May, 1909. No. 4744 C.

Notes on the Tonnage-Life and Wear of Stones in Road Surfaces. John A. Brodie. Read at Road Conference, London. Calls attention to differences in wear of the same stone when used in varying forms of construction. 2000 w. Surveyor—May 7, 1909. No. 4707 A.

Wear and Tear of Motor Traffic on Roads. W. J. Taylor. Read at Road Conference, London. Discusses the injuries, their causes, and remedies. 1700 w. Surveyor—May 7, 1909. No. 4712 A.

Roads for Automobile Traffic (Die Anpassung der Strassen an die Automobile). Alfred Ritter Weber von Ebenhof. A review of the discussion at the Paris road congress. Ills. 8300 w. Oest

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Wochenschr f d Oeffent Baudienst—June 26, 1909. No. 6701 D.

An "Accelerated Test" of Road Wear by Automobile Traffic. Illustrated report of the effect of heavy motor-bus traffic on a paved highway in Germany. Also editorial. 2000 w. Eng News—July 8, 1909. No. 6227.

Extraordinary Traffic and Heavy Weights on Roads. W. H. Schofield. Read before the Road Conference. Discusses damage by heavy motor vehicles. Serial, 1st part. 2500 w. Surveyor—May 28, 1909. No. 5453 A.

Extraordinary Traffic in its Legal Aspect. W. Joynson-Hicks. Paper read before the Road Conference. Deals with heavy and motor traffic. 2400 w. Surveyor—May 28, 1909. No. 5452 A.

Highway Administration and Reform. Discusses conditions in England, the need of reforming the present system of administration, with suggestions. 3000 w. Surveyor—Feb. 26, 1909. No. 3057 A.

Some Methods of Modern Road Construction. George W. Manning. From a paper before the Midland Assn. of Loc. Gov. Officers. Suggestions as to what should be done to fit English roads for modern requirements. 2500 w. Surveyor—Feb. 26, 1909. No. 3058 A.

The Construction and Maintenance of Roads. Albert V. Hart. The effect of self-propelled vehicles on roads is discussed, the stability of road surfaces, repair work, and cost of maintenance. 3500 w. Surveyor—Feb. 19, 1909. No. 2883 A.

The Development of Modern Road Surfaces. W. H. Fulweiler. Reviews briefly the ancient roads, and later street improvements, illustrating and describing types of road construction, and discussing the effect of automobiles, dust prevention, etc. Ills. 8000 w. Jour Fr Inst—Sept., 1909. Serial. 1st part. No. 7884 D.

Road Materials and Some Simple Rules for Testing Them. Austin B. Fletcher. Read at meeting of the First Congress of Road Builders. The discussion is limited to the materials found in Massachusetts. 3500 w. Engng-Con—Sept. 1, 1909. No. 7517.

Earth Roads. Maurice O. Eldridge. From a paper read at the first Am. Cong. Suggestions for the laying out and construction. 2500 w. Can Engr—Sept. 24, 1909. No. 8086.

Sub-Grade Preparation in Road Construction. James H. MacDonald. Abstract of paper before the first Am. Cong. of Road Bldrs. Directions for a well-built

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sub-grade. 1800 w. Engng-Con—Sept. 22, 1909. No. 8010.

Notes on Highway Improvements. D. McD. Campbell. Suggestions in regard to drainage, location, grades, and other practical matters. Ills. 5000 w. Can Engr—Jan. 8, 1909. No. 1654.

Standard Details for Highway Construction. Cuts and description of construction work under supervision of the Massachusetts state highway commission. 1100 w. Engng-Con—Jan. 6, 1909. No. 1590.

Experimental Road Work by the Massachusetts Highway Commission in 1908. Reviews work with dust layers, road preservatives, new binders, resurfacing, etc. 7000 w. Engng-Con—May 5, 1909. No. 4533.

Recent Maintenance Work of the Massachusetts Highway Commission. Describes experiments made to determine what method of construction should be used to prevent undue damage by automobiles and prevent intolerable dust. 6000 w. Eng Rec—March 20, 1909. No. 3273.

Highway Construction in New York State. J. C. Gotwals. Describes the steps necessary in state road improvement, and the method of macadam surfacing. 3200 w. Engr, Pa—Dec., 1908. No. 2010 D.

The Construction of Sand-Clay Roads. W. L. Spoon. From an address before the Roads School, at Waterloo, Ia. Discusses the materials and the method of mixing them. 1400 w. Engng-Con—Jan. 27, 1909. No. 2143.

Road Materials and Some Simple Rules for Testing Them. Austin B. Fletcher. Read before the Congress of Road Bldrs. Discusses principally materials used in Massachusetts, such as sand and clay, gravel, rock, and bituminous materials. 3500 w. Eng Rec—July 31, 1909. No. 6794.

The Cost of Constructing Macadam and Gravel Roads in Missouri, with Data on the Amount of Materials Required. From bulletin issued by the Missouri Highway Dept. 2000 w. Engng-Con—Aug 4, 1909. No. 6900.

Methods of Constructing Roads Over Soft Ground. Explains methods employed to secure good foundations for roads crossing bogs, swamps, etc. 3000 w. Engng-Con—June 30, 1909. No. 6117.

Specifications and Notes on Macadam Road Construction. A. N. Johnson. Considers in detail the road-bed, thickness of macadam, cross-slope, materials, etc., methods of construction, and related sub-

jects. 12500 w. Jour W Soc of Engrs—Dec., 1908. No. 1859 D.

Labor Cost of Constructing Eight Macadam Roads and Data on the Average Labor Cost of Macadam Construction. Information concerning roads built by the Illinois Highway Commission. 4000 w. Engng-Con—Nov. 18, 1908. No. 373.

Instructions for Making Macadam Roads Without Steam Roller. A. N. Johnson. From Bul. No. 4, Ill. Highway Con. Directions for the work. 2500 w. Munic Engng—June, 1909. No. 5559 C.

Systematic Patching of Macadamized Roads with a Specially Designed Steam Roller and Water Tank. J. S. Pickering. Paper read at the Roads Conference which described a special roller and method. 1540 w. Engng-Contr—June 2, 1909. No. 5307.

Homogeneous "Double-Sealed" Road 1500 w. Surveyor—April 23, 1909. No. 4453 A.

Petrolithic Pavement—An Improved Method of Oiled Road Construction. J. C. Black. Describes the construction and the required outfit. 2500 w. Cal Jour of Tech—Oct., 1908. No. 341.

Economic Hints for Macadam Road Contractors. 1800 w. Engng-Con—March 3, 1909. Serial. 1st part. No. 3026.

The Preparation of Macadam. Donald M. D. Stuart. A report of investigations on preparation of crushed stone. 2500 w. Surveyor—Feb. 19, 1909. No. 2881 A.

Concrete Roadways. Charles W. Ross. Second Prize article in contest of Ass'n of American Portland Cement Manufacturers. Describes the use of concrete in road-making, construction of curbing and sidewalks, bridges, walls, etc. Ills. 6000 w. Can Engr—June 4, 1909. No. 5390.

Concrete Roadways. Ernest M'Cullough. First prize paper. Considers this material from the standpoint of economy, of sanitation, and acceptability, discussing the construction and materials. 5500 w. Engng-Con—Sept. 1, 1909. No. 7516.

Macadam Roads. Austin B. Fletcher. Read before the Nat. Good Roads Cong. Considers the characteristics of the modern macadam road, their cost, the effect of automobiles, etc., giving information relating to roads in Massachusetts. 2800 w. Eng Rec—Oct. 2, 1909. No. 8240.

The Cost of Adapting Macadam Roads to Automobile Traffic. Henry Tipper. Gives some details of costs, which will vary in different places and under different conditions. 1800 w. Munic Engng—Sept., 1909. No. 8052 C.

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Asphalt Macadam Roadways. Clifford Richardson. Read at road congress at Yukon-Alaska-Pacific Ex. Reviews experience in road construction and considers the essentials for success in the use of the materials named. 1300 w. Eng Rec—July 17, 1909. No. 6400.

Experiments on Bituminized Macadam Pavements. Deals with experiments made at Newton, Mass. 2500 w. Munic Engng—June, 1909. No. 5560 C.

The Examination of Bituminous Materials for Road Construction. From a paper by Clifford Richardson and C. N. Forrest, before the Am. Soc. for Test. Mat. Describes methods in use in the N. Y. testing laboratory. 2000 w. Eng Rec—July 10, 1909. No. 6258.

The Effect of Free Carbon in Tars from the Standpoint of Road Treatment. Prevost Hubbard. Read before the Am. Soc. for Test. Mat. A report of investigations made to determine the effect. 4500 w. Engng-Con—July 14, 1909. No. 6331.

Bituminous Road Materials. Prevost Hubbard. Read at Nat. Good Roads Con. Information concerning the material, its application, and methods of road construction. 3300 w. Engng-Con—Sept. 29, 1909. No. 8231.

Sampittic Surfacing. Walter Wilson Crosby. Submits specifications for "Sampittic Surfacing" as, in the writer's opinion, the simplest form of the use of a hydrocarbon cement. 2200 w. Pro Am Soc of Civ Engrs—Feb., 1909. No. 3460 E.

Sampittic Surfacing. Discussion of Walter William Crosby's paper. Ills. 6000 w. Pro Am Soc of Civ Engrs—May 1909. No. 5108 E.

The Use of Tar, Oils and Emulsions on Macadam and Earth Roads. A. R. Hirst. Abstract of a paper before the Soc. of Wis. Engrs. Brief description of methods of dust prevention and wear. 2200 w. Engng-Con—April 14, 1909. No. 3975.

The Tarring of Roads. Prevost Hubbard. Abstract of Bul. 34 of the Office of Public Roads, Dept. of Agriculture. Illustrated explanation of how the work is done. 3500 w. Sci Am Sup—Jan. 2, 1909. No. 1432.

Tar for Roads. C. P. Price. Read before the New England Assn of Gas Engrs. Explains the latest and best methods of using tar as a road preservative and in the construction of new roads. Ills. Discussion. 4000 w. Am Gas Lgt Jour—May 24, 1909. No. 4933.

Tar as Applied to the Surface Treatment of Roads. Henry J. Skinner. Read

at meeting of Am. Gas Inst. An account of methods used and results obtained. 3000 w. Engng-Con—Oct. 20, 1909. No. 8794.

Experimental Tar Treatment on the Havel Road (Die Probeteuerungen auf der Havel-Chaussee). Describes and discusses dust-laying experiments in the neighborhood of Berlin. Ills. 3000 w. Zeitschr d Mit Motorwagen Ver—Sept. 15, 1909. No. 8670 D.

English Methods of Tar Spraying for Dust Prevention and Some General Costs of the Work. Gives a summary of some of the replies received to inquiries sent out by the paving committee of the London Metropolitan Borough Councils. 1500 w. Engng-Con—Sept. 29, 1909. No. 8230.

Tar and Its Uses in Modern Road Construction. E. Parnell Hooley. Read at first Am. Cong. Discusses ordinary country roads. 2200 w. Can Engr—Sept. 24, 1909. No. 8087.

Tar and Its Uses as a Dust Palliative. John Robinson. Deals with tar-spraying, tar-macadam, and tar-matrix. 2000 w. Surveyor—June 4, 1909. No. 5515 A.

The Problem on Roads. J. R. Findlay. Describes the tarring of roads, and discusses materials for road-making. 2000 w. Surveyor—Sept. 10, 1909. No. 7849 A.

Has Experience Demonstrated that the Oiling of Roads Is the Most Satisfactory or Economical Method of Preventing Dust and Preserving the Road Surface? A discussion at the annual convention, July 8, 1909. 2000 w. Pro Am Soc of Civ Engrs—Sept., 1909. No. 8190 E.

Dust Prevention. Report of official tests carried out by the Roads Improvement Assn. with calcium chloride. 4000 w. Auto Jour—Sept. 25, 1909. No. 8337 A.

Dust Prevention on Public Roads (Die Staubbekämpfung auf öffentlichen Strassen). Herr Fichtner. Discusses the use and effect of various dust preventatives. 4000 w. Zeitschr d Mit Motorwagen Ver—Dec. 31, 1908. No. 1973 D.

The Great German Military Road and Boulevard. H. Prime Kieffer. Illustrated detailed description of the construction of this road, which will probably be the most beautiful in the world. 3000 w. Munic Engng—June, 1909. No. 5558 C.

Italian Highways (Le Strade ordinarie in Italia). A detailed description of the systems of road administration, construction and maintenance in the various provinces. Serial, 1st part. 4700 w. Monit Tech—July 30, 1909. No. 7240 D.

The Road Improvement Bill. Discusses the proposed Board in England,

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and its powers, giving a synopsis of the bill. 2500 w. Surveyor—Sept. 3, 1909. No. 7739 A.

Road Exhibition in Paris, 1908 (Die Pariser Strassenbauausstellung 1908). A. Liebmann. Describes an exhibit of road and pavement materials and machinery in connection with the first International Road Congress. 2500 w. Glasers Ann—Sept. 15, 1909. No. 8683 D.

Boulder Stones in Southern Ontario—Their Road-Making Qualities. Andrew F. Macallum, and T. Aird Murray. Discusses the materials at hand for making good roads in Southern Ontario. 2200 w. Can Engr—March 5, 1909. No. 3004.

Sanitation.

Sanitary Engineering in 1908. Reviews the Report of the Royal Commission, and also progress, new works and other matters. 2500 w. Engr, Lond—Jan. 1, 1909. No. 1714 A.

The Status of the Modern Sanitary Engineer. George W. Chilvers. Reviews recent progress in sanitation. 4000 w. Surveyor—March 19, 1909. No. 3606 A.

Civic Sanitation. Frank K. Chew. A brief account of what is being done by the health department of New York City. Ills. 1200 w. Dom Engng—Sept. 11, 1909. No. 7708.

State Health Laws and the Engineer. F. Herbert Snow. On the state regulation of water-works systems and drainage systems. 2000 w. Pro Engrs' Club of Phila—Jan., 1909. No. 6362 D.

The Sanitary Significance of Bacteria in the Air of Drains and Sewers. C.-E. A. Winslow. Summary and conclusions of a report made to the Sanitary Committee of the Nat. Assn. of Master Plumbers of the U. S. 3000 w. Eng News—Sept. 2, 1909. No. 7533.

Disinfection of a Large Dairy Premises and Many Employees After Scarlet Fever. Charles E. North. Describes how the work was carried out. 2000 w. Eng News—July 22, 1909. No. 6621.

See also Cesspools, under MUNICIPAL.

Septic Tanks.

Septic Tank Patents. Prof. A. Marston. Gives a brief review of their history and of court decisions. 3500 w. Munic Engng—Nov., 1908. No. 346 C.

A Reinforced-Concrete Pressure Sedimentation Tank. Harold D. Elfreth. Illustrated detailed description of the construction and operation of a plant at Whitehall, N. Y. 1600 w. Eng News—March 25, 1909. No. 3492.

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Sewage Disposal.

Fundamental Principles of Sewage Purification on Land. Rudolph Hering. Reviews the phases of sewage purification, as based on a study of practice in Europe and America, especially considering the physical conditions. 6500 w. Eng News—May 6, 1909. No. 4521.

Principles of Sewage Purification. George W. Fuller. A lecture at Cornell Univ. Remarks on conditions, outlining a series of problems and their solution as illustrated by actual projects. 4500 w. Eng Rec—May 15, 1909. Serial, 1st part. No. 4688.

Sewage Disposal and Purification. C. M. Arnold. A review of what has been accomplished and the methods proved successful. 2500 w. Can Engr—May 21, 1909. No. 4916.

Modern Methods of Sewage Disposal as Applied to Public Institutions. Frank Grove. Prize paper. Briefly considers the methods of treatment by irrigation, by chemical treatment, and biological filtration. Ills. 2200 w. Surveyor—Oct. 23, 1908. No. 64 A.

The Purification of Sewage by Bacterial Treatment on Peat Beds (Études sur l'Épuration des Eaux d'Égout sur des Lits bactériens de Tourbe). A. Müntz and E. Lainé. A general review of the process and a discussion of its efficiency, with results of tests. Ills. 10500 w. Bul Soc d'Encour—April, 1909. No. 4868 G.

The Sewage Problem Popularly Stated. Clark P. Collins. Brief description and comparison of the methods of sewage disposal commonly practiced. 4000 w. Sci Am Sup—Feb. 20, 1909. No. 2530.

An Introduction to Sewage Purification Problems (Einführung in die Frage der Abwasserreinigung). A. Lübbert. A general review of present practice. Serial. 1st part. 5800 w. Zeitschr d Ver Deutscher Ing—Jan. 2, 1909. No. 2835 D.

Methods of Sewage Disposal. Alexander Potter. A brief discussion of the various systems used. 2500 w. Munic Engng—June, 1909. No. 5561 C.

A New Method of Sewage Purification (Der Emscherbrunnen, ein neues Verfahren der Abwasserreinigung). P. Kurgass. Describes a system adapted to cities of moderate size. Ills. 3300 w. Zeitschr d Ver Deutscher Ing—Oct. 24, 1908. No. 605 D.

The Administrative Aspects of Sewage Disposal. Herbert T. Scoble. Paper read before the Surveyors' Inst. 7000 w. Surveyor—Nov. 27, 1908. No. 851 A.

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Status of Sewage Disposal in America. Alexander Potter. From an address at Indianapolis, Ind. On the need of concerted action and advising the creation of a National Board of Health to advise and arbitrate where interstate questions arise. Ills. 1500 w. *Munic Engng*—Aug., 1909. No. 7029 C.

A Committee Report on Sewage Disposal in the United States. Information prepared for a committee appointed by the City Council of Trenton, N. J. 8500 w. *Engng-Con*—Oct. 6, 1909. No. 8416.

The Problem of Sewage Disposal. W. D. Scott-Moncrieff. First of a series of four lectures at the Univ. of London. Reviews the history of sanitation in England. 8000 w. *Surveyor*—March 12, 1909. Serial. 1st part. No. 3408 A.

The Royal Prussian Testing Institute for Water and Sewage Purification. A. Elliott Kimberly. Explains the function of the Institute, the departments, general features, etc. 1500 w. *Eng News*—Jan. 28, 1909. No. 2154.

A New Method of Treating Sewage. K. Imhoff. Illustrated description of method of sewage treatment used in Germany, in which deep tanks receive the sludge. 2500 w. *Surveyor*—May 21, 1909. No. 5189 A.

Sludge Disposal under Water and the Grimm Purification System (Klär-schlammgewinnung unter Wasser und die Grimmsche Flachbecken - Kläranlage). Herr Mierisch. A criticism of Dr. Lübbert's paper, with reply by Dr. Lübbert. Ills. 2500 w. *Gesundheits-Ing*—May 29, 1909. No. 5799 D.

The Disinfection of Sewage. From the U. S. Geol. Survey paper No. 229, by Prof. Earle B. Phelps, discussing results of recent investigations. 2500 w. *Eng. Rec*—May 29, 1909. No. 5146.

Subsurface Distribution in Percolating Sewage Filters. Wm. Gavin Taylor. Describes tests made at the Waterbury, Conn. sewage disposal works. Ills. 2000 w. *Eng Rec*—June 5, 1909. No. 5281.

Modern Aspects of Sewage Disposal and Sewerage Problems. T. Aird Murray. Read before the Saskatchewan Med. Assn. Discusses various systems and their value. 6500 w. *Can Engr*—July 16, 1909. No. 6377.

Discussion on Topics Connected With Sewage Disposal. 8000 w. *Pro Engrs' Club of Phila*—Jan., 1909. No. 6363 D.

Sewage Purification Works Visited in Europe. George S. Webster. Describes interesting features observed. 3500 w.

Pro Engrs' Club of Phila—Jan., 1909. No. 6361 D.

Sewage Disposal. Discusses methods calculated to remove putrescibility. 2000 w. *Can Engr*—Aug. 6, 1909. Serial. 1st part. No. 6936.

The Work of the Royal Commission on Sewage Disposal. H. Lemmoin-Cannon. Discusses some points of interest brought out in the latest Blue Book. 4000 w. *Builder*—Sept. 18, 1909. No. 8104 A.

The Disposal of Sewage. Editorial review of the latest report of the Royal Commission. 2000 w. *Engng*—Oct. 1, 1909. No. 8492 A.

The Present Position of the Sewage Disposal Question. W. J. Dibdin. Read before the Inst. of San. Engrs. Remarks on the Fifth Report of the Royal Commission, and gives a report of the slate bed for the treatment of crude sewage. Ills. 3500 w. *Surveyor*—Oct. 8, 1909. Serial. 1st part. No. 8877 A.

Some Notes on the Tank Treatment of Sewage, Based on the Fifth Report of the Royal Commission. A. P. I. Cotterell. Considers the subject from an engineering point of view. Discussion. 4000 w. *Surveyor*—June 18, 1909. No. 6032 A.

The Hampton Doctrine in Relation to Sewage Purification. Dr. A. Lübbert. Trans. from the German. Discusses a paper by W. Owen Travis, showing that the Hampton doctrine cannot exist along with Dunbar's absorption theory. 3000 w. *Surveyor*—Dec. 4, 1908. Serial. 1st part. No. 1013 A.

The Hampton Doctrine in Relation to Sewage Purification. W. Owen Travis. Reply to the criticisms of Dr. A. Lübbert. 3500 w. *Surveyor*—Dec. 18, 1908. Serial. 1st part. No. 1385 A.

The Hampton Doctrine. Dr. A. Lübbert. A discussion of a paper by W. Owen Travis on "The Hampton Doctrine in Relation to Sewage Purification." Serial. 1st part. 2200 w. *Gesundheits-Ing*—Jan. 2, 1909. No. 2805 D.

The Demonstration of the Hampton Doctrine (Ueber die Beweisführung der Hampton doctrine). A. Lübbert. A reply to the criticism of W. O. Travis in the *Surveyor*. Serial. 2 parts. 3000 w. *Gesundheits-Ing*—Aug. 14 and 21, 1909. No. 7981 each D.

Some Observations of Methods, Cost and Results of Sewage Purification Abroad. H. W. Clark. Discusses the kind of sewage plants that are being built and operated in England and elsewhere, and matters relating to them. General

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discussion. Ills. 14000 w. Jour Assn of Engng Soc's—Nov., 1908. No. 1343 C.

Sewage and Its Distribution (Ueber Abwassermengen und deren zeitliche Verteilung in Strassenkanälen). Otto Schubert. A note on the determination of the size of purification plants. Plates. 2000 w. Gesundheits-Ing—Jan. 30, 1909. No. 2808 D.

Experimental Treatment of Effluents of Sprinkling Sewage Filters. Notes from the annual report of the Massachusetts Board of Health on the results of experiments made at the Lawrence Experiment Station. 1700 w. Eng Rec—Nov. 28, 1908. No. 696.

On Percolation Beds. William Clifford. An account of experiments relating to the physical conditions obtaining in sewage filter-beds, with special reference to percolation beds. 4500 w. Inst of Civ Engrs—No. 3751. No. 883 N.

Percolation Beds for Sewage Treatment. William Clifford. Paper before the Inst. of Civ. Engrs. A report of investigations of the physical conditions accompanying purification. 4000 w. Eng Rec—Feb. 6, 1909. No. 2305.

An Aerating and Flushing System for Percolating Sewage Filters. William Gavin Taylor. Illustrates and describes types of floor systems, especially the false floor system installed at Waterbury, Conn. 3000 w. Eng News—Aug. 19, 1909. No. 7141.

Some Notes on the Separation of Solids from Sewage and Waste Liquors. James P. Norrington. Read before the Incor. Assn. of Munic. & Co. Engrs. Illustrates and describes arrangements for the removal of suspended matter. Also discussion. 7000 w. Surveyor—Oct. 15, 1909. No. 8878 A.

The Disinfection of Sewage and Sewage Filter Effluents. Earle Bernard Phelps. Condensed from Paper 229, U. S. Geol. Survey. Considers the purifying agents, the necessity of disinfection, methods, tests made, and conclusions. 5800 w. Engng-Con—Aug. 11, 1909. No. 7005.

Sewage Purification by the "Oxychlorides" Process. Editorial review of Dr. S. Rideal's paper on the "Application of Electrolytic Chlorine to Sewage Purification and Deodorization by the "Oxychlorides" Process, read before the Faraday Society. 2000 w. Engng—Feb. 12, 1909. No. 2597 A.

The Use of Peat in the Construction of Biological Sewage Purification Plants (Ueber die Verwendbarkeit von Torf zum Aufbau von biologischen Abwasser-

reinigungsanlagen). Joseph Ghysen. A discussion of its value as a purifying agent. Ills. 4000 w. Gesundheits-Ing—Jan. 2, 1909. No. 2804 D.

The Theory of Sedimentation and the Grimm Purification System (Zur Theorie der Sedimentierung und die Grimmsche Flachbecken-Kläranlage). A. Lübbert. Describes and discusses the Grimm system. Ills. 2400 w. Gesundheits-Ing—Jan. 30, 1909. No. 2810 D.

The Principal Claims of Collecting Sewers (Ueber Sammelkanäle und deren Höchstbeanspruchung). Wilhelm Voit. A discussion of their design, with description of types, etc. Ills. Serial, 1st part. 2500 w. Zeitschr d Oest Ing u Arch Ver—July 9, 1909. No. 7452 D.

The Lawrence Experiments Regarding the Distribution of Sewage over Sprinkling Filters. From the report of H. W. Clark describing the researches of the Massachusetts Board of Health. 6000 w. Eng Rec—Dec. 26, 1908. No. 1247.

An Unhindered Cesspool. A True Short Story of Domestic Sanitation. Robert Fletcher. Describes the conditions and discusses the principles for a small disposal plant. 2200 w. Eng News—Dec. 17, 1908. No. 986.

The Application of Small-Scale Biological Purification (Le Applicazioni della Depurazione biologica agli Edifici isolati). Illustrates and describes various systems of sewage treatment for isolated houses. 4200 w. Monit Tech—Nov. 20, 1908. No. 1136 D.

An Electrically-Driven Sewage System. Illustrated description of the installation of ejectors at Whickham, near Newcastle-on-Tyne. 1700 w. Elect'n, Lond—Jan. 1, 1909. No. 1700 A.

Small Sewage Purification Plants (Die Abwasserreinigung im Kleinbetrieb). Dr. A. Lübbert. Reviews a number of small plants for hotels, villages, etc., with comments on current practice. Ills. Serial. 1st part. 2500 w. Gesundheits-Ing—Feb. 27, 1909. No. 3391 D.

The Purification of Sewage by Intensive Biological Treatment (Épuration des Eaux d'Égout par le Procédé biologique intensif). M. B. Bezault. A comparison with the filtration process. Ills. 12000 w. Mem Soc Ing Civ de France—Dec., 1908. No. 3301 G.

Composition, Tests, and Utilization of Colombes Sewage Residues (Analyses et Expériences sur les Boues de Colombes et Remarques sur leur Utilisation). E. Damour. An examination of the possibility of using sewage residues in the gas

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producer. 3100 w. Bul Soc d'Encour—Jan., 1909. No. 3311 G.

Merchants' Association Plans for Treating New York Sewage Beneath the Street Surface. Explains the proposed plan. Also editorial discussion. 2500 w. Eng News—March 4, 1909. No. 3001.

A Scientific Scheme for Sewage Disposal by Dilution in New York Harbor. Editorial discussion of the plan of the Passaic Valley Sewerage District, and the discharge of sewage into New York harbor. 2000 w. Eng News—Dec. 17, 1908. No. 984.

Proposed Method of Discharging Sewage from the Passaic Valley Into New York Bay. Descriptive. 900 w. Eng Rec—April 10, 1909. No. 3865.

Official Reports on Discharge of Sewage into New York Harbor. Information from the reports of Col. W. M. Black concerning the amount of sewage that may be discharged into the harbor and the proper treatment. 1800 w. Eng Rec—Oct. 23, 1909. No. 8702.

Reports by Col. W. M. Black on the Pollution of New York Harbor and the Proposed Passaic Valley and Bronx Valley Sewer Outlets. 7500 w. Eng News—Oct. 21, 1909. No. 8822.

The Sewer System of San Francisco, and a Solution of the Storm-Water Flow Problem. C. E. Grunsky. Describes the topography and conditions to be met, the design of a sewer system, methods of estimating capacity, types of sewers, etc. Maps. 28000 w. Pro Am Soc of Civ Engrs—March, 1909. No. 3495 E.

The Sewer System of San Francisco, and a Solution of the Storm-Water Flow Problem. The paper by C. E. Grunsky is discussed. 6500 w. Pro Am Soc of Civ Engrs—Aug., 1909. No. 7370 E.

Sewage Purification Works at Mt. Vernon, N. Y. George L. Robinson. Illustrates and describes features incident to the location of sewage-treatment works near a built-up section of the city. 1700 w. Engng News—April 29, 1909. No. 4361.

Philadelphia Experiments in Sewage Disposal. Illustrated description of the Spring Garden Experiment Station, with an account of the work in progress. 1800 w. Munic Jour & Engr—Oct. 27, 1909. Serial. 1st part. No. 8709.

Waterbury Sewage and Its Septic Action. William Gavin Taylor. Gives results of a comprehensive study of the characteristics of the sewage, its behavior under septic action, its purification, &c. 5000 w. Eng News—June 3, 1909. No. 5217.

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Sewage Contact Filters with Automatic Control at Auburn. Illustrated detailed description of a recently completed plant at Auburn, N. Y. 2000 w. Eng Rec—Aug. 21, 1909. No. 7305.

The New Sprinkling Filter at Reading. Illustrated description of the addition to the sewage purification plant which has doubled the filtering area. 3500 w. Eng Rec—Sept. 25, 1909. No. 8067.

Baltimore's Sewage Disposal Plant. Illustrated detailed description of an extensive plant under construction. 2500 w. Mfrs' Rec—Sept. 30, 1909. No. 8169.

The Sewage Disposal Works of Baltimore. Plan and description of the general arrangement of the works. 2000 w. Eng Rec—Feb. 27, 1909. No. 2848.

The Louisville Sewerage Improvement's. Roger DeL. French. Map and illustrated description of extensive improvements, including an outfall sewer. 3000 w. Eng Rec—May 1, 1909. No. 4391.

Sewage Disposal at Columbus, Ohio. E. A. Kemmler. Illustrated detailed description of the sewage purification works consisting of septic tanks, sprinkling filters and settling basins, all constructed of concrete and steel, with data of operation. 4000 w. Munic Jour & Engr—May 5, 1909. No. 4514.

Sewerage of East St. Louis. Drawings and description of the pumping station and its equipment, and the concrete sewers. 2000 w. Munic Jour & Engr—May 5, 1909. No. 4515.

Sewerage Treatment at Bloomington, Ind. George L. Thon. Illustrates and describes the sewerage system for a town of about 8000 inhabitants. 2000 w. Munic Jour & Engr—May 5, 1909. No. 4516.

Some Sewage Purification Problems in Wisconsin. G. J. Davis, Jr. States the present conditions and some of the problems needing solution. Ills. 2500 w. Wis Engr—June, 1909. No. 5693 D.

Sewage Disposal and Treatment by Electricity. Harry E. Mayhew. An account of a sewage purification plant at Santa Monica, Cal. Ills. 1200 w. Dom Engng—Sept. 11, 1909. No. 7707.

Ilford Sewage Disposal Works. Herbert Shaw. Read before the Assn. of Mfrs. of Sewage Disposal Works. Plan and description of method of treating domestic sewage. 2500 w. Surveyor—April 30, 1909. No. 4607 A.

Sewage Disposal at Birmingham, England. An account taken from an official report by E. J. Fort. 2500 w. Eng Rec—Feb. 6, 1909. No. 2309.

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The Durham Main Sewerage Works. H. W. Taylor. Reviews the original scheme of sewage disposal, and describes the scheme finally adopted, with information related. Ills. 3000 w. Surveyor—Sept. 3, 1909. No. 7738 A.

Special Features of the Travis Hydro-litic System of Sewage Tanks Being Constructed at Norwich. Arthur E. Collins. Read before the Royal Sanitary Institute. Describes the formation and elimination of matters deposited from sewage. 5100 w. Surveyor—May 28, 1909. No. 5451 A.

The Treatment of Sewage. Harold Pritchard. Remarks on recent works, describing a small installation in the rural district of Burnley. Discussion. 3000 w. Surveyor—Feb. 19, 1909. No. 2882 A.

Sewerage and Sewage Disposal Works at Ruislip-Northwood. W. Louis Carr. Sketches the conditions and general character of the district, showing the difficulties, methods of overcoming them, and the results. 5000 w. Surveyor—July 30, 1909. No. 6969 A.

The Unna Biological Purification Plant (Die biologische Kläranlage der Stadt Unna). C. Modersohn. Describes the construction and operation of a plant to serve a city of 11,000 inhabitants. Ills. 3800 w. Gesundheits-Ing—Jan. 23, 1909. No. 2807 D.

Sewage Disposal and Purification in Nagyszeben, Hungary (Die Kanalisation und Abwasserreinigungsanlage der K. u. K. Freistadt Nagyszeben in Ungarn). Emerich Forbath. Illustrated discussion of the conditions and description of the sewerage installations. Serial, 1st part. 4500 w. Gesundheits-Ing—Sept. 18, 1909. No. 8687 D.

See also Culverts, under BRIDGES; Drainage, under MUNICIPAL; Harbor Pollution, under WATERWAYS AND HARBORS; and Purification and Sterilization, under WATER SUPPLY.

Sewage Drying.

Schaefer-ter Meers Centrifugal Machine for Sewage Sludge. Illustrated description. 1500 w. Engng—Oct. 15, 1909. No. 8934 A.

Sewage Pumping.

See Pumping Plants, under MECHANICAL ENGINEERING, HYDRAULIC MACHINERY.

Sewage Purification.

Sewage Purification versus Water Filtration. George C. Whipple. Read before the Am. Soc. of Munic. Imp. A discussion of the place and value of each, and

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the need of both. 2500 w. Eng Rec—Oct. 31, 1908. No. 24.

See also Purification, under WATER SUPPLY.

Sewage Tanks.

A Concrete Sewage Tank Reinforced Against External Pressure. Explains conditions and gives an illustrated description of the storage tank. 1500 w. Eng Rec—Dec. 19, 1908. No. 1056.

Sewage Testing.

Sewage Testing Station for the City of Philadelphia. Illustrated description of details of the equipment and work of investigation, with a view of determining the processes best adapted to secure desired results. 2500 w. Eng Rec—July 17, 1909. No. 6399.

Sewerage Statistics.

Sewerage Statistics. Collected and tabulated by the Sanitary Section of the Boston Society of Civil Engineers. 2500 w. Jour Assn of Engng Socs—March, 1909. No. 4912 C.

Sewer Gases.

Bacteria in Sewer Air. C. E. A. Winslow. An examination of the possibilities of disease infection being carried by means of sewer air, with conclusions. 3000 w. Can Engr—Aug. 20, 1909. No. 7181.

Sewer Gauging.

Some Sewer Gaugings. Delmar E. Teed. Read before the Mich. Engng. Soc. Explains methods used to measure the daily discharge of the sewers, and the data obtained. Ills. 1700 w. Munic Engng—Feb., 1909. No. 2334 C.

Sewers.

The Use of Concrete in Sewer Construction. Peter Gillespie. Discusses the relative advantages of brick and concrete. 3000 w. Contract Rec—Jan. 6, 1909. No. 1653.

Building a Reinforced Concrete Pipe Sewer. Alexander J. Taylor. Read before the Am. Soc. of Munic. Imp. Describes methods of construction. 2500 w. Munic Engng—Jan., 1909. No. 1739 C.

Town and Country: Some Aspects of Town Planning. H. V. Lanchester. Discusses town improvements, street planning, decorative effects, park systems, etc., with special reference to England. Ills. Discussion. 10000 w. Jour Roy Inst of Brit Archts—Feb. 20, 1909. No. 3115 C.

Sewer Tunnelling. Alfred E. Snape. Read before the Inst. of Co. and Munic. Engrs. Describes methods used in actual

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practice. Ills. 6000 w. Surveyor—July 9, 1909. Serial, 1st part. No. 6415 A.

Sewer Tunneling in London. Notes from a paper by Alfred E. Snape, read before the Inc. Assn. of Munic. & Co., Engrs., describing methods employed. Ills. 3500 w. Eng Rec—Aug. 14, 1909. No. 7076.

A Study Into the Comparative Advantages of Day Labor and Contract Sewer Construction. 3500 w. Engng-Con—Aug. 25, 1909. No. 7343.

Comparative Efficiency and Cost of Brick Masons' Work by Contract and by Day Labor in Sewer Construction. A comparison of work in Boston and vicinity. 1500 w. Engng-Con—Sept. 22, 1909. No. 8011.

Sea Outfall-Sewers. Ben Howorth. Considers the requirements of such sewers, and describes outfall-sewers on the British Coasts. 5000 w. Inst of Civ Engrs (Students' paper No. 615.)—Feb. 13, 1908. No. 6453 N.

Recent Improvements of Stony Brook, Boston. Illustrated description of work under supervision of the sewer department, and of the interesting features of the contractor's plant. 2800 w. Eng Rec—Feb. 6, 1909. No. 2308.

The Construction of the Bronx Valley Sewer. Illustrates and describes the construction of this sanitary sewer which is to serve eight villages along the Bronx River. 5000 w. Eng Rec—Jan. 9, 1909. No. 1570.

Some Details of the Design and Construction of the Baltimore Sewerage System. Illustrates and describes the outfall sewer, siphon culvert, weir in force main sewer and other details. 3000 w. Eng Rec—Dec. 19, 1908. No. 1059.

The New Sewerage System of Baltimore, Md. Explains the problems and describes the system. Ills. 3500 w. Eng Rec—Dec. 5, 1908. No. 834.

Reinforced Concrete Intercepting Sewer. Alexander J. Taylor. Illustrates and describes a sewer at Wilmington, Del., explaining the difficulties. 3000 w. Munic Jour & Engr—Nov. 18, 1908. No. 331.

Construction of a Concrete Block Sewer in Toledo, Ohio. Frank I. Consaul. Illustrated description of the work and local conditions. 1000 w. Eng News—Feb. 4, 1909. No. 2273.

The Sewerage Work at Louisville, Kentucky. Roger DeL. French. Illustrates and describes the new outfall and intercepting sewers. 1000 w. Jour Worcester Poly Inst—May, 1909. No. 4991 C.

Some Notes on the Louisville Sewerage Improvements. Roger DeL. French. Describes the more interesting features of the work. Ills. 1500 w. Eng News—Oct. 14, 1909. No. 8566.

Sewer Work in Louisville, Ky. Illustrated account of extensive work in progress, including an outfall sewer of reinforced concrete. 2000 w. Munic Jour & Engr—June 23, 1909. No. 5818.

Sewers and Sewage Pumping at Grand Rapids, Mich. Explains conditions and illustrates and describes the sewage disposal and pumping plants. 1500 w. Munic Jour & Engr—Aug. 11, 1909. No. 6998.

Early History of Sewers in Memphis, Tenn. A. T. Bell. Describes the city and the special features of the sewer system. 2500 w. Munic Engng—Oct., 1909. No. 8510 C.

Cost of a 66-Inch Brick Sewer at Gary, Indiana. E. M. Scheffow. Gives itemized labor cost of the work. 1500 w. Eng Rec—Jan. 2, 1909. No. 1422.

Sewer Construction in Chicago. Illustrated description of the concrete sewer work of the Ninety-fifth Street system. 3000 w. Munic Jour & Engr—Dec. 2, 1908. No. 748 A.

Asphalt Sewer-Pipe Joints at Monmouth, Illinois. John S. Bates. Explains conditions requiring a joint-filler, and the use of asphalt. 1500 w. Eng Rec—Jan. 9, 1909. No. 1577.

Sewerage and Drainage Improvements at Cairo, Illinois. Illustrates and describes sewers for a city at the junction of the Ohio and Mississippi rivers, and so needing protection from floods. 1800 w. Eng Rec—April 17, 1909. No. 4014.

Methods and Cost of Constructing a Concrete Sewer in Freezing Weather. Describes work at Fond-du-Lac, Wis., during Nov. and Dec., 1908, with the thermometer ranging from 15 degrees below zero, to the freezing point. Ills. 1500 w. Engng-Con—Jan. 27, 1909. No. 2142.

Planning the Clinton Sewers. C. P. Chase. From a paper before the Iowa Soc. of Engrs. An account of the surveys made and statistics gathered for planning a sewer system. 1700 w. Munic Engng—April, 1909. No. 3818 C.

Methods of Sewer Construction in Clinton, Iowa. Charles P. Chase. From a paper before the Iowa Soc. Describes construction methods, giving instructions issued for work in freezing weather, and approximate costs. 2500 w. Munic Engng—May, 1909. No. 4550 C.

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The Extension of the Glaise Creek Sewer in St. Louis. Illustrated detailed description of the construction. 2500 w. Eng Rec—June 12, 1909. No. 5488.

A Large Reinforced Concrete Sewer. Methods and costs of construction of a large section of sewer in the Northern part of St. Louis. 2300 w. Eng Rec—June 5, 1909. No. 5282.

The Sewerage System of Salt Lake City. L. H. Krebs. Plan and description of the separate system in use. 3500 w. Jour Assn of Engng Socs—April, 1909. No. 5842 C.

The Water-Works and Sewerage of Monterey, Mex. Illustrated account of the water supply and main drainage works being constructed by Monterey Railway, Light and Power Company. Plate. 1500 w. Engr, Lond—Nov. 6, 1908. Serial. 1st part. No. 327 A.

Glasgow South-Side Sewage Outfall Works. Illustrates and describes some details of works under construction. 1500 w. Engr, Lond—Feb. 5, 1909. No. 2493 A.

The Sewers of Belgrade and the Construction of the Upper Collecting Sewer (Einige Mitteilungen über die Kanalisation von Belgrad und den Bau des Hauptsammlers der oberen zone). Ludwig Roth. Illustrated description of extensive concrete sewer construction. 2000 w. Beton u Eisen—April 2, 1909. No. 4897 F.

See also Excavation, under CONSTRUCTION; and Drainage, under MUNICIPAL.

Sewer Trenches.

Comments on methods of Excavating Trenches and Ditches. First instalment of a series of articles which will discuss methods and costs. Ills. 2150 w. Engng-Contr—June 2, 1909. No. 5306.

See also Excavation, under CONSTRUCTION.

Sidewalks.

Sidewalk and Curb Design and Construction. Selections from a pamphlet of instructions issued by the Board of Public Works of Poughkeepsie. Ills. 2500 w. Munic Engng—Sept., 1909. No. 8054 C.

Failures in Concrete Sidewalks and How to Correct Them. L. J. Riegler. From a report to the Pennsylvania Co. An illustrated study of causes and remedies. Also standard specifications of the Nat. Assn. of Cement Users. 3500 w. Eng News—April 1, 1909. No. 3757.

Stone Crushing.

New Stone-Crushing Plant of the Dolese & Shepard Company. Illustrated description of the plant at Gary, Ill., and

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its operation. 3500 w. Eng Rec—July 24, 1909. Serial, 1st part. No. 6650.

Cost of Operating a Stone Crushing Plant by City Employees for Three and One-Half Months, Boston, Mass. Data from the report of the Finance Commission, describing the method of operation and giving results. 3500 w. Engng-Con—Aug. 11, 1909. No. 7004.

See also Quarrying, under MINING AND METALLURGY, MINING.

Street Cleaning.

The Automobile in Street Cleaning (Der automobile Antrieb für Zwecke Strassenreinigung). D. Nier. Gives comparative cost of street sprinkling with horse-drawn and self-propelled sprinklers. 2500 w. Gesundheits-Ing—Nov. 7, 1908. No. 1170 D.

Street Grading.

A New Method of Grading and Draining Street Intersections. William W. Marr. Gives arguments for and against the forms known as "inlet corners" and "summit corners," and describes a form which is believed to be an improvement. Ills. 1000 w. Eng News—Oct. 7, 1909. No. 8405.

Street Grades. Discussion from report of Nelson P. Lewis of A. S. Tuttle's study of precise grades and of grade platforms at street intersections in New York City. Ills. 2000 w. Eng Rec—Oct. 16, 1909. No. 8592.

The Seattle Regrade, with Particular Reference to the Jackson St. Section. Louis P. Zimmerman. An illustrated de-leveling of the hilly streets and adjacent description of the extensive re-grading and property. 2200 w. Eng News—Nov. 12, 1908. No. 230.

Street Records.

Method of Keeping Data Relating to Street Lines and Grades. H. A. Varney. Explains the method used by the town of Brookline, Mass. 900 w. Eng News—July 8, 1909. No. 6225.

Street Sprinkling.

Electric Car Street Sprinkler at The Hague (De elektrische motorsproeiwagen der Openbare Reiniging te's-Gravenhage). G. H. E. Bergsma. Illustrated description. 2000 w. Ingenieur—July 10, 1909. No. 7481 D.

Swimming Pool.

A Water Works Swimming Pool. Willis B. Durlin. Describes the public swimming pool at the pumping station in Erie, Pa. Ills. 1500 w. Pro Am W-Wks Assn—1908. No. 5949 N.

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Accounting

Accounting.

Some Suggestions Relating to Uniformity in the Accounts, Financial Reports and Statistics of Water Works. Albert H. Wehr. 12000 w. Am W-Wks Assn—June, 1909. No. 5902 N.

Useful Uniform Accounts and Reports of Water-Supply Systems. L. G. Powers. A discussion of Mr. Wehr's paper. 3300 w. Am W-Wks Assn—June, 1909. No. 5924 N.

Analysis.

The Mineral Analysis of Water for Industrial Purposes and Its Interpretation by the Engineer. Herman Stabler. Presents simple calculations and formulae of assistance in classifying waters for industrial purposes. 5000 w. Eng News—Oct. 1, 1908. No. 211.

Analytical Reports on Water Samples. Fred A. Anderson. A discussion designed for engineers who have to use the results of water analyses as reported by chemists. 2500 w. Elect'n, Lond—Feb. 19, 1909. Serial. 1st part. No. 2879 A.

The Determination of Carbonic Acid in Water (Beitrag zur Bestimmung der Kohlensäure im Wasser). Dr. F. Guth. A discussion of the various methods. 6000 w. Gesundheits-Ing—Nov. 21, 1908. No. 1172 D.

Aqueducts.

An Old Aqueduct and Its Development. Albert L. Sawyer. A review of the history of the Haverhill (Mass.) Aqueduct Co. Ills. 6500 w. Jour N Eng W.Wks Assn—Dec., 1908. No. 1884 F.

The Hudson River Crossing of the Catskill Aqueduct. William B. Hoke. An account of the engineering work done with the aim of determining the best crossing, the material through which a tunnel must pass, etc. Ills. 2000 w. Eng. Pa—Dec., 1908. No. 2008 D.

A Combined Water-Supply, Irrigation, and Power Project. Burt A. Heinly. An illustrated account of the plan, construction, and purposes of the Los Angeles aqueduct. 3000 w. Engineering Magazine—Nov., 1909. No. 8829 B.

Construction Work on the Los Angeles Aqueduct. E. W. Bannister. Brief outline of the project and description of the aqueduct, illustrating and describing the progress made in 1908. 4500 w. Eng Rec—April 3, 1909. No. 3699.

Repairs to the Cher River Crossing of the Berry Canal (Réparation du Pont Canal de la Tranchasse). M. Barrat. Report on repair work on this aqueduct in

Barrages

France. Ills. 11200 w. Ann d Ponts et Chaussées—1908-VI. No. 3317 E + F.

See also Washington, D. C., under WATER SUPPLY.

Artesian Waters.

The Brown Artesian Waters of Costilla County, Colo., their Relations to Certain Deposits of Natron or Soda, and What They Teach. William P. Headden. A study of a basin yielding brown waters, surrounded by a supply of colorless water. 4000 w. Am Jour of Sci—April, 1909. No. 3804 D.

Artesian Wells.

Artesian Waters of the Atlantic Coastal Plain. Myron L. Fuller. Illustrates and describes the geologic development, sources of artesian waters, their quality, temperature and related characteristics. 8000 w. Pro Am W-Wks Assn—1908. No. 5939 N.

Conservation of Our Artesian Water-Supply. Frederick G. Clapp. Considers the amount of underground water, its uses, causes of decline, &c. 5000 w. Eng News—July 15, 1909. No. 6384.

The Progress of Artesian Well Work in Dry Countries. Editorial review of what has been done in later years, in the more arid regions of the earth, to provide water from underground supplies under pressure. 2500 w. Engng—Sept. 24, 1909. No. 8365 A.

Ashokan.

The New Water Supply of New York City. H. Prime Kieffer. Describes the Ashokan water system, now under construction. Ills. 3000 w. Munic Engng—July, 1909. Serial, 1st part. No. 6444 C.

Progress on the Ashokan Reservoir. Information concerning the construction of this 127,000,000,000 gal. for the additional supply of New York City. 4500 w. Eng Rec—Sept. 4, 1909. No. 7558.

See also Aqueducts, and Reservoirs, under WATER SUPPLY.

Backwater.

New Methods in Backwater Computations. B. F. Groat. Explains the application of a new formula for stream flow to the problem, and also mechanical and graphical methods for ascertaining areas of cross-sections for various degrees of backwater. 2500 w. Minn Engr—Jan., 1909. No. 2730 C.

Barrages.

The Isna Barrage Across the Nile. Illustrated description of this important

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irrigation work in Egypt. 2500 w. Sci Am—March 6, 1909. No. 2970.

The Esneh Barrage for Irrigation in Egypt. Briefly reviews the scheme of irrigation in the Nile valley, giving illustrated description of the barrage across the Nile at Esneh. Plates. 6800 w. Engng—Feb. 5, 1909. No. 2486 A.

The Esneh Barrage. Photographs, drawings and description of work in Egypt designed to hold up the low floods on the Nile. Plate. 3000 w. Engr, Lond—Jan. 22, 1909. No. 2221 A.

Civil-Service Law.

Civil Service in Its Application to the Water Department. Joseph C. Pelletier. An explanation of the Civil Service law as applied to this service. Discussion. 5500 w. Jour N Eng W-Wks Assn—June, 1909. No. 6464 F.

Cofferdams.

See Concrete, under CONSTRUCTION.

Conduits.

The Dulzura Conduit of the Southern California Mountain Water Co.; Extension of San Diego Water Supply. M. M. O'Shaughnessy. Illustrated description of the construction of a 13-mile open conduit, in connection with the water supply work for San Diego. 3000 w. Eng News—Nov. 26, 1908. No. 638.

The Design of an Eight-Mile High-Head Hydraulic Conduit. Lars Jorgensen. Remarks on the choice of type, with description of a closed conduit consisting of a buried concrete floor-pipe and rock-tunnel pressure pipe. 2500 w. Eng News—Aug. 5, 1909. No. 6909.

Design of Conduits of Variable Diameter on the Basis of Maximum Economy of Material (Calcolo delle Condotte d'Acqua a Diametri Variabili in Base al Criterio della Massima Economia di Materiale). Mario Dornig. Mathematical and theoretical. Ills. 3000 w. Ann d Soc d Ing e d Arch Ital—Sept. 15, 1908. No. 540 F.

Conservation.

The Conservation of Water Resources. M. O. Leighton. Brief discussion of the steps necessary in the conservation of the water resources of the United States. 2500 w. Jour N Eng W-Wks Assn—Dec., 1908. No. 1880 F.

Water Supply Conservation in Mountainous Districts (Ueber Wasserwirtschaft im Gebirge). Max Singer. A discussion referring particularly to conditions in Austria. Ills. Serial, 1st part. 2800 w. Zeitschr d Oest Ing u Arch Ver—July 2, 1909. No. 7451 D.

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Coolgardie.

Coolgardie (W. A.) Water Scheme. R. J. Vincent. Read before the Engrs' Assn., N. S. W. Illustrated detailed description of the government water supply scheme. 4000 w. Aust Min Stand—May 19, 1909. Serial. 1st part. No. 5825 B.

Copenhagen.

Copenhagen Water Supply. William P. Mason. Illustrated description of a deep well supply. 700 w. Pro Am W-Wks Assn—1908. No. 5931 N.

Croton.

Development of the Croton Watershed. An illustrated review of the system of reservoirs developed in the valley of the Croton River for the supply of New York City. 3000 w. Sci Am—Dec. 5, 1908. No. 812.

Dams.

Some Observations on the Stability of Dams. J. F. Jackson. Presented to the W. Soc. of Engrs. Discusses the manner of calculating and constructing the various generally accepted types. Diagrams. General discussion. 2500 w. Eng News—July 29, 1909. No. 6771.

Earthen Dams. Frank Reed. Gives specification and practical profile based on actual practice. 1500 w. Aust Min Stand—June 23, 1909. No. 6865 B.

The Behavior of Clays in Earth Dams Built by Hydraulic or by Dry Processes. An interesting discussion by James D. Schuyler, and a reply by F. C. Finkle with report of experiments. 2500 w. Eng News—Sept. 23, 1909. No. 8019.

Stresses in Masonry Dams. William Cain. Report of an investigation made to determine the amounts and distribution of the stresses in a masonry dam, at points not too near the foundations. 3500 w. Pro Am Soc of Civ Engrs—Jan., 1909. No. 2124 E.

The Principal Stresses and Planes in a Masonry Dam. Frank Harvey Hummel. Gives a determination of the stresses and principal planes in a dam of triangular section, showing in a diagram the variation of the stresses in magnitude and direction. 600 w. Inst of Civ Engrs—No. 3815. No. 8161 N.

The Strength of Masonry Dams (Der Spannungszustand einer Staumauer). O. Mohr. Mathematical and theoretical. Ills. Serial. 1st part. 2700 w. Zeitschr d Oest Ing u Arch Ver—Oct. 2, 1908. No. 570 D.

Experimental Investigations of the Stresses in Masonry Dams Subjected to Water Pressure. Paper 3674, by Sir John

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Walter Ottley and Arthur William Brightmore; Paper 3705, by John Sigismund Wilson and William Gore; Paper 3583, by Ernest Prescott Hill, discussed together. Also correspondence. Plates. 50000 w. *Inst of Civ Engrs*—No. 889 N.

The Construction of Concrete Dams. F. M. Hoadley. An illustrated comparison of solid masonry and hollow, concrete dams. 1200 w. *Cassier's Mag*—Oct., 1909. No. 8466 B.

A Sketch of the Recent Development of Movable Dams. Albert B. Cudebec. Outlines the important types giving a general idea of the present development. 1500 w. *Cornell Civ Engr*—March, 1909. No. 3201 C.

Needle Dam, Pleasanton Reclamation Project, California. James K. James. Outlines the aims of this project and gives an illustrated description of this movable dam, discussing the hydrostatic pressures when the dam is full. 3500 w. *Cal Jour of Tech*—Feb., 1909. No. 3501.

The Movable Dams and Lock at the Power Plant on the Chicago Drainage Canal. Plan and illustrated description of the locks and dams for controlling water flow and passing navigation at the Lockport, Ill., power plant. 3000 w. *Eng News*—Nov. 12, 1908. No. 231.

The Design of Emergency Movable Dams for Canal Locks. Letter from H. G. Tyrrell giving illustrations and description of the safety dams at Sault Ste. Marie. 1700 w. *Eng News*—June 24, 1909. No. 5867.

A Successful Low Timber Dam for Broad, Sandy River Channels. O. K. Parker. Illustrations, with description of methods of construction. 1200 w. *Eng Rec*—Dec. 5, 1908. No. 832.

The Construction of a Spillway on the Tombigbee River. Detailed description of the methods of construction. Ills. 2000 w. *Eng Rec*—May 22, 1909. No. 4927.

Fish Ways in Dams (Fischwege in Stauanlagen). Dr. H. Löschner. A practical discussion of their arrangement. Ills. 3300 w. *Oest Wochenschr f d Oeff Baudienst*—Nov. 14, 1908. No. 1182 D.

The Caméré System of Fish Ways installed in the Dams of the Rivers l'Hyères and l'Aulne (Note sur les Echelles à Poissons du Système Caméré établies aux Barages verticaux des Rivières l'Hyères et l'Aulne). M. le Guillier. Illustrated description. Plate. 3000 w. *Ann d Ponts et Chauss*—1908-IV. No. 1312 E + F.

A Report on the Foundations and Construction of the Gatun Dam. From the recent report of C. M. Saville giving re-

sults of the investigations. 1200 w. *Eng News*—Dec. 24, 1908. No. 1241.

Experimental Hydraulic - Dredge - Fill Dams at Gatun, made for the Isthmian Canal Commission. C. M. Saville. From Appendix E, Report of the Isthmian Canal Commission. Illustrated description. 6500 w. *Eng News*—Dec. 24, 1908. No. 1242.

Concerning the Gatun Dam and Earth Dams in General. An illustrated explanation of conditions and construction details at Gatun, and a study of the principles of earth dam design. 5000 w. *Eng News*—April 1, 1909. No. 3761.

The Designs for Emergency Movable Dams for the Panama Canal. Drawings and description of the present accepted designs explaining the method of operation. 3500 w. *Eng News*—July 22, 1909. No. 6619.

The Closure of the Charles River Dam. Edward C. Sherman. An illustrated account of the dropping of the gates of the "shut-off" dam at Boston. 900 w. *Eng News*—Nov. 5, 1908. No. 102.

The Improvement of the Charles River at Boston, Mass. Edward C. Sherman. An interesting illustrated account of the construction of the Charles River dam and basin, and related improvements. 1800 w. *Sci Am*—Feb. 6, 1909. No. 2281.

The Undermining of a Reinforced-Concrete Dam at Pittsfield, Mass. Gives drawings and points of engineering interest in the undermining of the Ashley dam, and the possible methods of repair. 3000 w. *Eng News*—April 1, 1909. No. 3758.

The Construction Work of the New Dam of the Bellows Falls Canal Company. Howard S. Knowlton. Describes plan and construction of a concrete dam across the Connecticut River. Ills. 2500 w. *Eng Rec*—April 3, 1909. No. 3718.

The Popen Brook Dam. Illustrated description of a concrete dam near Stanwich, Conn. 1000 w. *Eng Rec*—April 3, 1909. No. 3695.

The Olive Bridge Dam Concrete Plant. Illustrated description of the plant installed for the construction of this dam for the Ashokan reservoir in the Catskill Mts. It will be one of the largest and highest masonry dams in the world. 2000 w. *Eng Rec*—April 3, 1909. No. 3691.

The Griffin Concrete Dam. Illustrated description of a dam at Griffin, Pa., for supplying water for locomotive tanks on the B. & O. R. R. 1000 w. *Eng Rec*—May 15, 1909. No. 4691.

Hydraulic Dam Construction on the Conconully Dam, Washington. D. C. Henry. Describes the experience and difficulties met in constructing by the hydraulic process this earth fill dam located in Washington and forming a part of the Okanogan project. Ills. 4500 w. Eng Rec—April 3, 1909. No. 3687.

The Ohio River Dam and Lock No. 37, Near Cincinnati, O. Illustrated detailed description of important engineering work in connection with the improvement of river navigation. 5000 w. Eng News—March 4, 1909. No. 2996.

The Core Wall in a River Wing Dam at Moline, Ill. Illustrates and describes the construction of a core wall to meet conditions quite out of the ordinary. 2000 w. Eng Rec—Feb. 6, 1909. No. 2307.

The Government Dam Across the Rock River at Sterling, Ill. Fred. W. Honens. Illustrated description of conditions and construction of this dam. The overflow portion is a rock-filled crib dam; the remainder consists of a series of vertically revolving gates in sluiceways. 6500 w. Eng News—Aug. 5, 1909. No. 6907.

A Hydraulic Fill Dam in South Carolina. H. Sudlow. Describes features of interest in the construction of a small hydro-electric plant near Aiken. 2000 w. Eng Rec—Oct. 2, 1909. No. 8239.

The Failure of the Fergus Falls, Minn., City Dam. Franklin McMillan. An illustrated account of the construction and failure of this concrete dam, caused by floods. 1500 w. Eng News—Oct. 14, 1909. No. 8561.

Construction of the Pathfinder Dam, North Platte Project, United States Reclamation Service. E. H. Baldwin. Illustrates and describes the construction of this masonry dam of the modified arch type. 2500 w. Eng Rec—Nov. 7, 1908. No. 136.

Turning the Colorado River and Completing the Laguna Dam, Arizona-California. Edwin D. Vincent. Illustrated detailed description of the work of closing the Colorado River and the building of the sluiceways. 2500 w. Eng News—June 10, 1909. No. 5459.

The Granite Reef Dam and Gate Mechanism. F. Teichman. Describes particularly the diversion dam and the devices that turn the water into the two canals, in the Salt River Irrigation Project, Arizona. Ills. 2000 w. Eng News—Jan. 7, 1909. No. 1636.

The La Prele Dam. Illustrated description of an open-front hollow reinforced-concrete dam being constructed as

a part of an irrigation project in Wyoming. 2000 w. Eng Rec—April 3, 1909. No. 3688.

The Failure of an Irrigation Dam. Richard R. Lyman. Illustrated account of the failure of a dam in central Utah, caused by the bottom becoming saturated and slipping. 2000 w. Eng Rec—Sept. 18, 1909. No. 7816.

The Failure of Bluewater Dam in New Mexico. George G. Anderson. Brief account of a failure due to floods. 600 w. Eng News—Sept. 30, 1909. No. 8207.

A Reinforced-Concrete Spillway with Concentrated Crest Length. D. W. Murphy. Illustrated description of a spillway recently constructed at Klamath Falls, Ore. 800 w. Eng News—Sept. 9, 1909. No. 7626.

The Construction of the Barker Dam Near Boulder. Illustrated description of methods used in constructing a masonry dam having a height of 185 ft. above the foundation. 4500 w. Eng Rec—Oct. 2, 1909. No. 8233.

The Arrowhead Hydraulic Fill Dam. F. C. Finkle. Illustrated description of the construction in California of the highest earth dam in the world. 1800 w. Eng Rec—April 3, 1909. No. 3716.

The Slide in the Necaxa Hydraulic-Fill Dam. Notes by James D. Schuyler on the design of the dam and its failure. Ills. Also editorial. 3500 w. Eng News—July 15, 1909. No. 6385.

Hydraulic-Fill Dams and the Necaxa Accident. Editorial on the recent slip of a portion of this dam near the City of Mexico, and the lesson it should teach. 1500 w. Eng Rec—July 3, 1909. No. 6171.

Accident to Necaxa Dam No. 2. Describes this accident in Mexico, showing the causes that contributed and the steps proposed for the reconstruction and restoration. Ills. 2000 w. Engr, Lond—July 30, 1909. Serial, 1st part. No. 6988 A.

The Chuviscar Dam of the Chihuahua Water Works. A concrete dam, faced with dressed stone, to impound flood waters as a reserve for water supply. Describes method of treating a cavern crossing the site of the dam. Ills. 2000 w. Eng Rec—March 27, 1909. No. 3539.

The Construction of Three Reservoir Dams in the Valley of the Ondaine (Note sur la Construction de trois Barrages-Réservoirs dans la Vallée de l'Ondaine). M. Reuss. The structures are of masonry. 10000 w. Ann des Ponts et Chaussées—1908-VI. No. 3313 E + F.

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Discharge Coefficients

Reconstruction of the Roanne Water-Supply Dam (Reconstruction du Barrage de Frise d'Eau en Loire à Roanne). M. Mazoyer. Describes reinforced-concrete caisson construction. Ills. 6500 w. Ann d Ponts et Chauss—1908-IV. No. 1310 E + F.

Repairs in Reinforced-Concrete to the Crampagna Barrage, Ariège, France (Réfection en Béton armé du Barrage de Crampagna, Ariège). C. Picot. Describes the work of closing a breach 26 metres long. Ills. Plate. 1800 w. Tech Mod—Sept., 1909. No. 8617 D.

Heightening the Assuan Dam Across the Nile. Frederick Hall Fowler. An illustrated account of the new construction. 6000 w. Eng News—Sept. 30, 1909. No. 8203.

Economical application of Water Power in Tasmania. James B. Lewis. Gives the cost and method of construction of dams. 2000 w. Aust Min Stand—Nov. 18, 1908. No. 1093 B.

See also Concrete and Excavation, under CONSTRUCTION; Soil Testing, under MEASUREMENT; Barrages and Reservoirs, under WATER SUPPLY; Barge Canal and Lock Gates, under WATERWAYS AND HARBORS; and Hydro-Electric, under ELECTRICAL ENGINEERING, GENERATING STATIONS.

Discharge Coefficients.

On Coefficients of Discharge Through Sluice-Gates and over Weirs. H. F. Labelle. Gives results of experimental investigations, especially those of Prof. Chatterton, on the Kistna River, India. 2500 w. Eng Rec—Dec. 26, 1908. No. 1249.

On the Variation of the Coefficient of Discharge for Small Orifices. T. P. Strickland. Describes experimental work and the apparatus used. 4500 w. Can Soc of Civ Engrs—Jan. 7, 1909. No. 1742 N.

Distillation.

Modern Plants for the Distillation of Water (I moderni Impianti distillatori d'Acqua). Gustavo Pincherle. Describes briefly the plant necessary, modern apparatus, etc. 3000 w. Monit Tech—Aug. 20, 1909. No. 7945 D.

Distribution.

A Problem in the Economic Design of Water Distribution Systems. Rudolph Hering. A statement of the reasons why the central-main system is superior to the ring system. 1200 w. Eng News—Aug. 12, 1909. No. 7052.

WATER SUPPLY

Cheap Transportation and Delivery of Public Water Supply. H. C. Heermans. Gives a bulletin to consumers, issued by the company at Hoquiam, Washington, with remarks. 1500 w. Am W-Wks Assn—June, 1909. No. 5923 N.

The Distribution of the Waters of the Mology (La Distribution des Eaux du Mology). K. A. Breuer. Describes novel features in connection with the works for utilizing the waters of this small Swiss river. Ills. Serial, 1st part. 2300 w. Bul Tech d l Suisse Romande—June 25, 1909. No. 6541 D.

Ditches.

Ditches. Douglas Waterman. A discussion of the most economic ditch section. Ills. 1500 w. Min & Sci Pr—March 6, 1909. No. 3091.

The Yukon Ditch. T. A. Rickard. Illustrated description of a system of ditch, pipe and flume which has a total length of more than 70 miles. 2500 w. Min & Sci Pr—Jan. 16, 1909. Serial, 1st part. No. 2018.

The Vaucouleurs Regulating Trench of the Marne-Saône Canal (Rigole d'Alimentation du Canal de la Marne à la Saône dite de Vaucouleurs). MM. Suquet and Changey. Illustrated detailed description. 11500 w. Ann d Ponts et Chaussées—1909-II. No. 5714 E + F.

See also Excavation, under CIVIL ENGINEERING, CONSTRUCTION.

Diversion Damages.

The Adjustment of Diversion Damages by Storage Compensation. Robert E. Horton. Describes English practice, discussing the difficulty of employing it in the United States. 7000 w. Jour N Eng W-Wks Assn—Sept., 1908. No. 665 F.

Dover, England.

The Dover Watershed and Water Supply. Henry Edward Stilgoe. Describes the physical features of this watershed with a view to ascertain where the largest supplies may be obtained. Plates. 5000 w. Inst of Civ Engrs—No. 3730. No. 884 N.

Filtration.

The Filtration and Purification of Water for Public Supply. John Don. Abstract of a paper selected for the first award of the "Water Arbitration Prize," 1908. Discusses the sources of supply, impounding, filtration, and distribution. Ills. 8000 w. Inst Mech Engrs—Jan. 15, 1909. No. 2200 N.

The Efficiency of the American Process of Water Filtration. James M. Caird. Illustrates and describes various plants,

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Filtration

explaining methods by which the waters are treated and the results. 14000 w. Pro Am W-Wks Assn—1908. No. 5943 N.

Some Results Obtained by the Application of Hypochlorite of Lime on Mechanical and Slow Sand Filters and Method of Controlling Coagulant and the Operation of the Orifice Boxes. A. E. Walden. Ills. 1500 w. Am W-Wks Assn—June, 1909. No. 5909 N.

The Puech-Chabal System of Filtration. Photographs and sectional drawing of the plant installed at Magdeburg, with description of the system. 800 w. Engng—Feb. 26, 1909. No. 3065 A.

The New Unsubmerged Sand Filters of Miquel and Mouchet (Les nouveaux Filtres à Sable non submergé Système de MM. le Docteur P. Miquel et Mouchet). Félix Marboutin. Discusses the efficiency of trickling filters, gives results of tests, and describes the Miquel and Mouchet system. Ills. 19000 w. Mem Soc Ing Civ de France—Feb., 1909. No. 4809 G.

Mechanical Filters. Replies to inquiries relative to mechanical filtration as applied to water supplies. Ills. 1800 w. Can Engr—Aug. 27, 1909. No. 7407.

Notes on Certain Points in the Design of Large Filtration Plants. S. Bent Russell. Gives a brief outline of the component parts of a modern plant, with special attention to the washing of the filters, and notes on certain plants. 4500 w. Jour Assn of Engng Socs—June, 1909. No. 7806 C.

Development of Devices for Cleaning the Sand of Slow Sand Filters. E. M. Nichols. Brief descriptions of the methods and machines tried, and an illustrated description of the Nichols sand cleaning apparatus. 1500 w. Eng News—Sept. 30, 1909. No. 8208.

Sanitary Control of Filter Plants. Francis D. West. Deals with the operation of filter plants controlled by laboratory tests of the water delivered to consumers. Especially considers Philadelphia. 3000 w. Pro Engrs' Club of Phila—April, 1909. No. 7116 D.

The Cost of Five Slow Sand Filter Plants—Four small and one large. Data from installations at Ashland, Wis., Berwyn, Pa., Nyack, N. Y., Superior, Wis., and Washington, D. C. 3500 w. Engng-Contr—June 2, 1909. No. 5315.

The Cost of Four Slow Sand Filter Plants and Cost of Operation. 4500 w. Engng-Con—July 7, 1909. No. 6205.

The Torresdale Preliminary Filters of the Philadelphia Water Supply. Illus-

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trates and describes mechanical filters for removing suspended particles without the use of a coagulant. 4500 w. Eng Rec—Nov. 14, 1908. No. 248.

Operating Results and Costs, Torresdale Filtration Plant. Explains the methods of operation at this Philadelphia plant, the results obtained, and cost. 2500 w. Eng Rec—July 31, 1909. No. 6796.

Recent Upward Water Filters. Brief report of the arrangement of filter tanks at Jerome Park reservoir, New York. 700 w. Eng. Rec—May 15, 1909. No. 4695.

Alternative Designs for Hand-Washed and Machine-Washed Slow-Sand Water Filters, Borough of Queens, New York City. Illustrations and information supplied by I. M. de Varona, in regard to designs for a filtration plant at Bayside Pumping Station. 1800 w. Eng News—May 20, 1909. No. 4781.

The New Covered Filters for Yonkers, N. Y. Illustrated detailed description of plant for filtering the river water. 3000 w. Eng Rec—Jan. 16, 1909. No. 1763.

Water Filtration at Springfield, Mass. An illustrated account of the difficulties overcome in the construction and operation of the Ludlow filters. 2500 w. Munic Jour & Engr—March 17, 1909. No. 3182.

Water Filters of Providence, R. I. Illustrated description of the construction of slow sand filters for the purification of the water supply. 2500 w. Munic. Jour & Engr—July 21, 1909. No. 6455.

The New Pittsburg Filters. Hartley M. Phelps. Illustrated description of the largest sand filtering plant in the United States. 3000 w. Munic Engng—Sept., 1909. No. 8053 C.

The Construction of Ten Additional Sand Filters at Pittsburg. Illustrated description of the new covered beds for slow-sand filtration, completing the largest plant in the United States. 4800 w. Eng Rec—Sept. 18, 1909. No. 7813.

The New Filtration Plant for Wilkinsburg. F. B. Leopold. Read before the Central States Water-Works Assn. Describes a mechanical filtration plant installed where unusual conditions had to be met. 2000 w. Eng Rec—Oct. 9, 1909. No. 8445.

Cincinnati's Water Filtration Plant. Illustrated description of the plant that gives the city a pure, clean, water supply. 2500 w. Munic Jour & Engr—Nov 4, 1908. No. 83.

Electrically Operated Filter Valves at Cincinnati, Ohio. F. H. Stephenson. The methods used are illustrated and de-

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scribed. 900 w. Eng Rec—Jan. 16, 1909. No. 1771.

Rate Controller of the Cincinnati Filters. Illustrated description of this design, which is really a balanced valve for regulating the discharge. 2000 w. Eng Rec—June 19, 1909. No. 5622.

Water Filtration Plant at Sandusky, Ohio. Detailed description of a purification plant costing about \$101,500, built of concrete without reinforcement. 2000 w. Eng Rec—Oct. 16, 1909. No. 8594.

New Orleans Water Filtration Plant. J. W. Armstrong. Illustrated detailed description. 3500 w. Munic Jour & Engr—June 2, 1909. No. 5204.

Preliminary Chemical Treatment as an Aid to Slow Sand Filtration; Indianapolis Water Co. H. E. Jordan. Slightly condensed paper before the Am. Chem. Soc. Explains the peculiarities of White River, from which the supply is taken, and describes the pre-treatment introduced during the period of high turbidity. Ills. 3500 w. Eng News—Aug. 5, 1909. No. 6908.

See also Contractors' Plants, under CONSTRUCTION; Sewage Purification, under MUNICIPAL; and Philadelphia, and Washington, D. C., under WATER SUPPLY.

Fire Protection.

San Francisco's Fire Service. David Paul. Describes a new and efficient service to be installed at an expense estimated at \$5,250,000. 2200 w. Sci Am Sup—March 26, 1909. No. 3580.

Fire Protection for San Francisco. Gives details of the high-pressure system and of the 100 fire cisterns to provide against damage by earthquakes. Ills. 2500 w. Munic Jour & Engr—June 16, 1909. No. 5497.

Calcium Chloride as a Preventative of Freezing in Automatic Sprinkler Systems. Rutger B. Green. Reports the successful use of this substitute for compressed air. 800 w. Eng News—Nov. 19, 1908. No. 376.

Fire Extinguisher Installation in the Milton Car House of the Boston Elevated Railway Company. Illustrated description of a system containing about 2400 sprinkler heads. 1200 w. Elec Ry Jour—Nov. 7, 1908. No. 109.

Fire Protection, Western Electric Works, Hawthorne. Illustrates and describes a very complete system installed near Chicago. 2500 w. Eng Rec—Aug. 14, 1909. No. 7075.

Insurance Rates and the Water Service. Frank A. Barbour. Describes improve-

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ments in supply for fire service that led to reduction in insurance rates. Discussion. 4500 w. Jour N Eng W-Wks Assn—Sept., 1908. No. 665 F.

Private Fire Protection and Insurance Rules. Gorham Dana. An explanation of the work of the insurance engineer, discussing the need of private fire protection, especially automatic sprinklers. General discussion. Ills. 8500 w. Jour N Eng W-Wks Assn—Dec., 1908. No. 1885 F.

Liability of Water Companies for Fire Losses. Chester R. McFarland. States cases where Kentucky, North Carolina and Florida held water companies liable. Also other cases. 3000 w. Am. W-Wks Assn—June, 1909. No. 5908 N.

Fish Ways.

See Dams, under WATER SUPPLY.

Flume Gaging.

An Approximate Method for Flume Gaging. Henry J. Kesner. The discussion is limited to an adaptation of the methods outlined to the case of rectangular flumes. 2000 w. Minn Engr—March, 1909. No. 4066 C.

Flumes.

Flow of Water in Flumes or Launderers. R. E. Neale. Notes applying not only to natural water-courses, but to artificial flumes. 900 w. Prac Engr—April 30, 1909. No. 4606 A.

Government Control.

Wisconsin Public Utility Law: Its Operation and Results. Charles B. Salmon. States the important provisions, discussing their value. 2500 w. Am W-Wks Assn—June, 1909. No. 5912 N.

See also Sanitation, under MUNICIPAL.

Ground Waters.

A Phase of Ground Water Problems in the West. W. C. Mendenhall. A study of the ground waters in arid or semi-arid regions. Map. 3800 w. Ec-Geol—Jan.-Feb., 1909. No. 2717 D.

Detecting Underground Streams with an Ear-Trumpet. Illustrated description of a new apparatus based on the principle of the "acoustele." 800 w. Sci Am—April 10, 1909. No. 3837.

The Indirect Determination of the Capacity of a Spring (Determinazione Indiretta della Portata di una Sorgente). Carlo Fossa-Mancini. Illustrated mathematical description of method. 4500 w. Ann d Soc d Ing e d Arch Ital—Oct. 1, 1908. No. 541 F.

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Ground Waters

Notes on the Hygienic Aspect of the Breslau Ground Water Supplies (*Gedanken über die Sanierung der Breslauer Grundwassergewinnungsanlagen*). Dr. Lübrig. Discusses the quality of the water supply, purification methods, etc. Serial. 1st part. 8800 w. *Gesundheits-Ing*—Oct. 3, 1908. No. 586 D.

An Instrument for the Determination of Ground-Water Levels (*Messwerkzeug für die Lagebestimmung des Grundwasserspiegels*). G. Thiem. Illustrated description of the apparatus and the method of use. 2000 w. *Gesundheits-Ing*—Dec. 12, 1908. No. 1966 D.

Underground Water in Slate and Shale. Frederick G. Clapp. Gives information showing that successful wells are frequent in slate formations. Ills. 3500 w. *Eng Rec*—June 12, 1909. No. 5489.

The Influence of Underground Air Currents on the Variation of Ground Waters (*Der Einfluss der unterirdischen Luftströmungen auf die Mengenschwankungen des Grundwassers*). Chr. Mezger. Serial. 1st part. 4500 w. *Gesundheits-Ing*—April 10, 1909. No. 4885 D.

A Note on Volger's Theory of the Formation of Ground Waters (*Ein Beitrag zur Volgerschen Theorie der Grundwasserbildung*). Herr Krüger. A criticism based on laboratory and field investigations. 4400 w. *Gesundheits-Ing*—July 10, 1909. No. 7293 D.

The Luzern Ground-Water Supply (*Die Grundwasserfassung der Stadt Luzern in Thorenberg*). V. Stirnimann. Describes a supply for a city of 36,000 inhabitants. Ills. 4500 w. *Schweiz Bau*—Aug. 28, 1909. No. 7970 B.

The Discovery of Subterranean Waters (*Descubrimiento de Aguas subterráneas*). Describes an instrument invented by P. Garcia Muñoz. 3000 w. *Energia Elec*—Sept. 10, 1909. No. 8645 D.

A New Method of Determining the Direction and Velocity of Flow of Ground Waters (*Nuovi Metodi per Determinare la Direzione e la Velocità delle Falde Acquee alluvionali*). Illustrated description. 2000 w. *Monit Tech*—Sept. 20, 1909. No. 8639 D.

Hastings, England.

The Water Supply of Hastings. P. H. Palmer. Reviews the history of the supply for this English town. 3500 w. *Surveyor*—July 23, 1909. No. 6845 A.

High Pressure.

High Pressure System for Chicago. Synopsis of report submitted by city engineer Ericson, giving data concerning high

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pressure systems in other cities, methods of pumping and costs. Ills. 4000 w. *Munic Jour & Engr*—Aug. 4, 1909. No. 6876.

High Pressure Water Supply in London (*Distribution d'Eau à haute Pression de la Ville de Londres*). J. F. Audouin. Describes the installations and distribution system of the London Hydraulic Power Co. Ills. 2000 w. *Rev Indus*—Sept. 4, 1909. No. 8623 D.

See also Fire Protection, under WATER SUPPLY.

Hydrostatics.

A Collection of Formulas for Water Pressure and Moments in Submerged Beams. D. N. Showalter. Collects in convenient form some of the formulas used by a designer of hydraulic work. 1200 w. *Eng News*—May 27, 1909. No. 5020.

Illinois.

Chemical and Biological Survey of the Waters of Illinois. Edward Bartow. A report of the work of the State Water Survey from Sept. 1, 1906, to Dec. 31, 1907, giving detailed description of the work accomplished. Ills. 19000 w. *Univ of Ill Bul*—Sept. 22, 1908. No. 2418 N.

The Mineral Content of Illinois Waters. Edward Bartow, J. A. Udden, S. W. Parr, and George T. Palmer. Deals with the distribution, geographical classification, chemical properties, analyses, etc. 38000 w. *Bul Univ of Ill*—Sept. 15, 1908. No. 8147 N.

Intakes.

The Intake of the Water Works at Algiers, Louisiana. Illustrated description of an intake designed specially to meet difficult local conditions. 1500 w. *Eng Rec*—July 3, 1909. No. 6175.

Water Intake for the Jones & Laughlin Steel Company. Francis Donaldson. Illustrated description of work in connection with the new Aliquippa plant on the Ohio River. 1600 w. *Eng Rec*—July 17, 1909. No. 6397.

See also Pipe Lines, under WATER SUPPLY; and Turbine Plants, under MECHANICAL ENGINEERING, HYDRAULIC MACHINERY.

Irrigation.

The Relations of Irrigation to Navigation. F. W. Hanna. Considers that the irrigation canals in arid regions are not likely to ever be used for navigation, but points out their beneficial influence by increasing production of agricultural products, preventing floods, etc. 1200 w. *Eng News*—March 25, 1909. No. 3491.

National Irrigation and Flood Control. Arthur P. Davis. Outlines the work of

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Irrigation

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the Reclamation Service, discussing results thus far. 1200 w. Eng Rec—Nov. 14, 1908. No. 254.

Irrigation Works of the United States Government. Illustrates and describes the extensive works being constructed in the arid and semi-arid regions. 3000 w. Engr, Lond—Sept. 17, 1909. Serial. 1st part. No. 8133 A.

The American Desert and Its New Water Works. Arthur P. Davis. Brief illustrated account of the large irrigation projects in arid areas of the United States. 1200 w. Pro Am W-Wks Assn—1908. No. 5944 N.

Work on the Roosevelt Irrigation Project in Arizona. D. A. Willey. Illustrates and describes applications of electric power to this work. 1500 w. Elec Rev, N Y—Aug. 14, 1909. No. 7067.

The Great Gunnison Irrigation Project. Albert Wilhelm. An illustrated brief description of the recently completed irrigation system of the Uncompahgre valley. 1200 w. Sci Am Sup—Sept. 18, 1909. No. 7804.

Watering the Uncompahgre Valley. Arthur Chapman. Illustrated account of this nearly completed irrigation project, which will reclaim more than 150,000 acres of land. 2500 w. Am Rev of Revs—Aug., 1909. No. 7019 C.

The Redemption of the Great Valley of California. A. D. Foote. Outlines a plan of basin irrigation and auxiliary works, similar to those used in the valley of the Nile, to protect from floods and store water for irrigation. Map. 6800 w. Pro Am Soc of Civ Engrs—Sept., 1909. No. 8180 E.

The Redemption of the Great Valley of California. Discussion of the paper by A. D. Foote. 2000 w. Pro Am Soc of Civ Engrs—Oct., 1909. No. 8848 E.

The Standley Lake Irrigation System Near Denver, Colorado. Illustrated description of a system of extensive works for the storage of water and its delivery to about 200,000 acres of land. 3500 w. Eng Rec—Oct. 16, 1909. Serial. 1st part. No. 8590.

Some Engineering Features of the Canadian Pacific Irrigation Project. Illustrates and describes work in Alberta. 1400 w. Munic Engng—Oct., 1909. No. 8509 C.

Irrigation in Hawaii. George B. Sturgeon. Describes the conditions, and the irrigation works for the production of sugar-cane. Ills. 2800 w. Cal Jour of Tech—Nov., 1908. No. 1795.

Irrigation Works in the Hawaiian Islands. M. M. O'Shaughnessy. An illus-

trated account of the extensive development of irrigation projects to furnish water for the sugar-cane lands. 5000 w. Eng News—April 15, 1909. No. 3977.

Proposed Construction of the Porto Rico Irrigation Service. B. M. Hall. A statement of the South Coast Irrigation Project in Porto Rico. Ills. 1600 w. Eng News—May 27, 1909. No. 5018.

Mechanical Irrigation Stations on the Nile. J. B. Van Brussel. Illustrates and describes an irrigation scheme carried out at Wadi Kom-Ombo, in Upper Egypt. 3000 w. Engineering Magazine—Feb., 1909. No. 2155 B.

Stray Notes on Engineering Matters in Egypt. J. C. Larminie. Illustrated review of works, including the Esna barrage and the Aswan reservoir and dam. 2000 w. Pub Works—Jan-March, 1909. No. 5646 D.

Nile Reservoirs and the Cotton Crop. Sir William Willcocks. Describes the reservoirs on the White Nile and discusses their best utilization for the advantage of Egypt and the Sudan. 7000 w. Pub Works—Oct-Dec., 1908. No. 3592 B.

Irrigation in the South-Western Districts of the Transvaal. Harben Robert Young. Describes some irrigation problems and the principal irrigation surveys in the south-western districts, not including the Vaal River. Ills. 4000 w. Pub Works—Oct-Dec., 1908. No. 3590 B.

Irrigation Works in India: New Projects in the Presidency of Madras. Percy F. Martin. Information concerning the Bhavani project, the Tungabhadra scheme, and the Kistna reservoir project. 3500 w. Engr, Lond—Jan. 29, 1909. No. 2370 A.

Irrigation in South-Eastern Australia. Describes the conditions and the scheme of water regulation. 2500 w. Engr, Lond—Nov. 13, 1908. No. 449 A.

Irrigation in Victoria. H. G. M'Kinney. An account of what has been done and the irrigation policy. 2500 w. Eng Rec—Jan. 16, 1909. No. 1764.

Irrigation in Victoria. Elwood Mead. An explanation of the conditions which caused financial loss in the earlier development, with hopeful outlook for the future. 1700 w. Eng Rec—Aug. 14, 1909. No. 7072.

Irrigation in the Lerma Valley (Irrigación en el Valle de Lerma). Carlos Wauters. A preliminary report on irrigation problems in this district in Argentina. 13500 w. Anales d l Soc Cien Argentina—Sept., 1908. No. 2656 E + F.

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Italy

Irrigation with Electric Pumps (Riego con Bombas eléctricas). Emilio Guarini. A description of the practice in the Department of Arequipa, Peru. 6400 w. *Anales d l Soc Cien Argentina*—March, 1909. No. 7253 E + F.

See also Tunnels, under CONSTRUCTION; Aqueducts, Barrages, Meters, and Seepage, under WATER SUPPLY; Canals, under WATERWAYS AND HARBORS; Hydro-Electric under ELECTRICAL ENGINEERING, GENERATING STATIONS; and Pumping Plants, under MECHANICAL ENGINEERING, HYDRAULIC MACHINERY.

Italy.

Water Supply Projects for Apulia (Die Wasserversorgungs-Anlage für Apulien). Dr. Brandau. An outline of a very large water-supply scheme for this district in Italy. Serial, 1st part. 1800 w. *Deutsche Bau*—April 10, 1909. No. 4874 B.

London.

Private Water Supply in London. Explains present conditions and the excessive charges for water, and the ease of obtaining an artesian supply. Ills. 2000 w. *Engng*—Nov. 13, 1908. No. 443 A.

Extensions of the London Water-Works. H. E. Drew. Sketch map and brief description of schemes in progress. 1500 w. *Eng Rec*—Oct. 2, 1909. No. 8238.

See also High Pressure, under WATER SUPPLY.

Long Island.

The Sources of and the Methods of Developing Long Island Water Supplies. Abstract of a paper by A. S. Farmer before the Municipal Engineers of the City of New York. Describes geologic conditions and development of wells. Ills. 7700 w. *Engng-Contr*—June 2, 1909. No. 5309.

Magdeburg.

The Elbe Water of Magdeburg. Information from a recent paper by Dr. Otto Pfeiffer, before the Verein Deutscher Ingenieure, concerning the conditions, sources of contamination, etc. 2500 w. *Engng*—Feb. 19, 1909. No. 2896 A.

Meters.

Meters and Meter Rates. W. Volkhardt. Brief discussion of this subject. 1000 w. *Am W-Wks Assn*—June, 1909. No. 5913 N.

Practical Workings of Detector Meters. R. J. Thomas. Explains the advantages of such meters, especially where used on services intended for fire protection only. Discussion, with notes on Private Fire Protection by D. R. Gwinn. 7500 w.

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Newark, O.

Pro Am W-Wks Assn—1908. No. 5930 N.

"Battery" Arrangement of Water Meters. George E. Booker. Illustrated description, with discussion. 1500 w. *Pro Am W-Wks Assn*—1908. No. 5983 N.

Meters and Water Consumption of the Hartford Water Works. Ermon M. Peck. An account of the metering of the service pipes and the results. 1800 w. *Jour N Eng W-Wks Assn*—Sept., 1908. No. 662 F.

Automatic Devices for Measuring Water used for Irrigation. F. W. Hanna. A summary of the methods most generally in use and discussion of some of the best American devices invented for this purpose. 3000 w. *Eng News*—Dec. 17, 1908. No. 981.

The Premier Meter. Arthur S. Tuttle. Illustrates and describes a precise apparatus for measuring the flow of water in large mains. 5000 w. *Pro Am W-Wks Assn*—1908. No. 5937 N.

The Sale of Potable Waters in Cities (La Vente de l'Eau potable dans les Villes). P. Juppon. Discusses the economics of water supply, the use of meters and the efficiency of the various types. 5500 w. *Génie Civil*—Jan. 23, 1909. No. 2644 D.

See also Condenser Meters, under MECHANICAL ENGINEERING, STEAM ENGINEERING.

Meter Testing.

Discussion of the Probable Errors Due to the Apparatus and Gauges Used for the Commercial Test of Meters. Nicholas S. Hill, Jr. 14800 w. *Pro Am W-Wks Assn*—1908. No. 5932 N.

Michigan City, Ind.

Method of Investigation of Character of Water Supply of Michigan City, Ind. A report of the investigations made and the results. 2000 w. *Munic Engng*—Jan., 1909. No. 1740 C.

Municipal Ownership.

Municipal Ownership in Edmonton. A Maclean. A brief outline of successful municipal enterprises, including water-works. 1700 w. *Am W-Wks Assn*—June, 1909. No. 5907 N.

Newark, O.

History of the Water Works Question at Newark, Ohio. H. C. Hodgkins. A review, with general discussion. 3500 w. *Pro Am W-Wks Assn*—1908. No. 5981 N.

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New Jersey

New Jersey.

Report of the New Jersey State Water Supply Commission. Discusses the water rights troubles. 1800 w. Eng News—Jan. 7, 1909. No. 1639.

Newton, Mass.

Newton's Water Supply System. A. W. King. Illustrates and describes a supply in Massachusetts of underground water obtained through pipe wells. 200 w. Munic Jour & Engr—Dec. 23, 1908. No. 1069.

New York City.

See Ashokan, Croton, Dams, and Reservoirs, under WATER SUPPLY.

New York State.

Report of the New York State Water Supply Commission. A review of the report for the year ending Feb. 1, 1909, with editorial. 8000 w. Eng News—Feb. 18, 1909. No. 2525.

The Water Supplies of New York State. H. D. Pease. A discussion of the aspects of the subject as related to the work of the State Board of Health. General discussion. 6500 w. Jour N Eng W-Wks Assn—March, 1909. No. 3633 F.

See also Water Powers, under WATERWAYS AND HARBORS.

Nitrogen.

The Significance of Nitrogen in Its Various Forms in Water Supply. F. E. Hale. Aims to emphasize the lack of sanitary significance in the presence of high free ammonia, or nitrate in ground supplies. Discussion. 6000 w. Pro Am W-Wks Assn—1908. No. 5940 N.

Orifices.

See Discharge Coefficients, under WATER SUPPLY.

Paris.

The Water Supply of Paris. Notes from a pamphlet by Easton Devonshire, describing the complex system. 4000 w. Eng Rec—Feb. 27, 1909. No. 2847.

Pennsylvania.

The Quality of Some Pennsylvania Waters. R. B. Dole. Read before the Eastern Ice Assn. Presents results of recent investigations into the mineral composition of the large rivers. 2500 w. Ice & Refrig—Dec., 1908. No. 996 C.

Philadelphia.

The Water Supply of Philadelphia, with Special Reference to the Filtration Works Now Under Construction. John C. Trautwine, Jr. Describes conditions before the works were begun, discussing the plan

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adopted. 8000 w. Jour Fr Inst—Nov., 1908. No. 350 D.

A Glance at the Water Supply of Philadelphia. John C. Trautwine, Jr. Notes on the history of the supply, progress and present condition of the filtration plant, etc. Ills. 5500 w. Jour N Eng W-Wks Assn—Dec., 1908. No. 1883 F.

See also Filtration, under WATER SUPPLY.

Pipe Cleaning.

The Necessity of Laying Water Mains with the View of Future Cleaning. George F. Whitney. A short paper, introducing a general discussion. Ills. 2800 w. Pro Am W-Wks Assn—1908. No. 5933 N.

Pipe Corrosion.

Electrolysis of Water Mains in Newark, N. J. From the report of William E. Foss, appointed to investigate the conditions. 2000 w. Eng Rec—Nov. 14, 1908. No. 251.

The Comparative Values of Various Coatings and Coverings for the Prevention of Soil and Electrolytic Corrosion of Iron Pipe. Robert B. Harper. Extracts from a paper read before the Ill. Gas Assn. Shows the comparative value of various protective coverings, describing the tests made. Discussion. 10500 w. Pro Age—June 15, 1909. No. 5491.

The Comparative Values of Various Coatings and Coverings for the Prevention of Soil and Electrolytic Corrosion of Iron Pipe. Robert B. Harper. Read before the Ill. Gas Assn. Gives data bearing on this subject, with description of the theories involved and tests made. 2500 w. Am Gas Lgt Jour—Aug. 9, 1909. Serial, 1st part. No. 6930.

Note on the Action of Water on Galvanized Iron. W. F. Monfort. Considers the action of a partially softened water upon the zinc coating of galvanized iron pipes as affecting their durability. Ills. 1500 w. Pro Am W-Wks Assn—1908. No. 5945 N.

Electrolysis of Winnipeg Water Mains. Louis A. Herdt. A report of the electrolysis investigation and survey with recommendations. Ills. 3000 w. Can Engr—Aug. 20, 1909. No. 7180.

The Rusting of Iron, and the Rochester, N. Y., Steel Conduit. This present article reviews recent researches introductory to a discussion of the practical side of the question. 3000 w. Engng—Aug. 27, 1909. Serial. 1st part. No. 7652 A.

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Pipe Electrolysis

Pipe Electrolysis.

Lead-Covered Cables a Cause of Electrolysis Upon Water and Gas Pipes. A. A. Knudson. Discusses electrolysis caused by bonding the lead sheaths to the railway return, examining methods of construction. Ills. 4000 w. Jour N Eng W-Wks Assn—June, 1909. No. 6461 F.

Pipe Flow.

The Flow of Water in Pipes, Culverts, and Channels. Ernest H. Essex. Read before the Inst. of Co. & Munic. Engrs. A comparison of different formulæ in use, and a record of recent tests. 3000 w. Surveyor—July 16, 1909. No. 6663 A.

See also Drainage, under MUNICIPAL.

Pipe Incrustation.

Character and Composition of the Incrustation from Discharge Pipe at Quincy, Illinois. Edward Bartow. Gives analysis of the incrustation, and also of the water. General discussion. 6000 w. Pro Am W-Wks Assn—1908. No. 5934N.

Pipe Joints.

Rubber Pipe Joints. Robert Spurr Weston. Describes this process, giving information regarding the method. Discussion. 3500 w. Jour N Eng W-Wks Assn—Sept., 1908. No. 664 F.

Pipe Laying.

Cost of Laying Water Pipes. Gives cost in Boston and other Massachusetts cities, with analyses and comparisons of figures reduced to a common basis. 1800 w. Munic Jour & Engr—Sept. 1, 1909. No. 7510.

Pipe Lines.

The Sub-Aqueous Pipe and Electric Cable Way at Gloucester, Mass. Herman W. Spooner. Explains the conditions and gives an illustrated detailed description of the engineering work. 6300 w. Jour N Eng W-Wks Assn—Sept., 1908. No. 661 F.

Laying Submerged Pipe for the Fort Greble Water Supply. Illustrated description of work in Narragansett Bay. 2000 w. Eng Rec—April 3, 1909. No. 3692.

The Pipe Line and Purification Works and Experiments of the Baltimore County Water & Electric Co., Maryland. A. E. Walden. An illustrated description of improvements, tests, etc. 4000 w. Eng News—March 18, 1909. No. 3239.

The Construction of the Submerged Intake of the Gary, Indiana, Water Works. Illustrated detailed description of unusual methods used in constructing this intake

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in Lake Michigan. 3500 w. Eng Rec—April 10, 1909. No. 3857.

Constructing a Line of Steel Pipe, 12½ Feet in Diameter. Illustrated description of methods of constructing a pipe line for the hydro-electric plant of the Schenectady Power Co. 2200 w. Eng Rec—April 3, 1909. No. 3701.

The 72-Inch Steel Pipe Line of the Brooklyn Water Supply. Outlines the system of supply and gives an illustrated detailed description of the new line for additional supply, and its construction. 4500 w. Eng Rec—Sept. 18, 1909. No. 7814.

Perturbations Produced by the Closing of Gate Valves in Water Pipe Lines (Perturbations produites par la Fermeture des Robinets-Vannes sur le Fonctionnement d'une Distribution d'Eau). Henry Dide. Theoretical and mathematical. Ills. 4000 w. Génie Civil—April 24, 1909. No. 4842 D.

Financial and Sanitary Considerations in the Establishment of Water and Gas Pipe Lines (Etablissement des Canalisations d'Eau et de Gaz au Point de Vue des Intérêts financiers et sanitaires). M. J. Gilbert. Discusses the effects of leakage in pipe lines and describes the pipe joint invented by the author. Ills. 7000 w. Mem Soc Ing Civ de France—June, 1909. No. 7902 G.

See also Ditches, under WATER SUPPLY; Drainage, under MUNICIPAL; and Pipe Lines, under MECHANICAL ENGINEERING, HYDRAULIC MACHINERY.

Pipe Location.

Location of Pipes and Conduits for Public Service Corporations. Lewis M. Hastings. Gives the city ordinances of Cambridge, Mass., bearing on this subject. 2500 w. Jour Assn of Engng Socs—July, 1909. No. 7812 C.

Pipes.

Modern Welded Pipe for Water and Gas. F. N. Speller. Read before the Am. Gas Inst. Discusses the comparative value of wrought iron and steel pipe. 2800 w. Eng News—Nov. 5, 1908. No. 101.

Reinforced Concrete Pipe with Reinforced Joint. Illustrated description of a reinforcement utilized also for making the joint between lengths. 700 w. Eng News—Dec. 10, 1908. No. 941.

Wrought-Iron Cement-Lined Water Pipe. Leonard Metcalf. A summary of acquired data with illustrated description of methods of manufacture and discussion of merits and demerits. General dis-

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Pipe Specifications

cussion. 30500 w. Jour N Eng W-Wks Assn—March, 1909. No. 3632 F.

The Strength of Oval Pipes under Internal or External Fluid Pressure (Festigkeit von ovalen Röhren gegen inneren oder äusseren Flüssigkeitsdruck). M. Westphal and J. Schmidt. Two short mathematical notes. Ills. 3000 w. Zeitschr d Ver Deutscher Ing—March 6, 1909. No. 4292 D.

The Design of Reinforced-Concrete Pipes to Withstand Compression and Bending (Calcul des Tuyaux en Béton armé soumis à des Efforts de Compression et de Flexion). P. Caufourier. Mathematical. 2600 w. Génie Civil—April 3, 1909. No. 4836 D.

Strength and Deflection of Nearly Circular Pipes under External Pressure (Festigkeit und Durchbiegung von Röhren gegen äusseren Flüssigkeitsdruck mit geringer Abweichung von der runden Form). M. Westphal. Mathematical. Ills. 2500 w. Zeitschr d Ver Deutscher Ing—July 24, 1909. No. 7477 D.

Pipe Specifications.

Standard Specifications for Cast Iron Pipe and Special Castings. Tables and illustrations. 7500 w. Pro Am W-Wks Assn—1908. No. 5989 N.

Pipe Strength.

The Collapse of Tubes Under External Pressure. S. E. Slocum. A study of recent experiments. 3500 w. Engng—Jan. 8, 1909. No. 1818 A.

See also Steam Pipes, under MECHANICAL ENGINEERING, STEAM ENGINEERING.

Pipe Trenches.

See Excavation, under CONSTRUCTION; and Sewer Trenches, under MUNICIPAL.

Pollution.

The Pollution of Streams. Gives the report submitted at the recent Washington Conference of State and Provincial Boards of Health. 5000 w. Eng Rec—Aug. 7, 1909. No. 6952.

Water and Sewerage Works in a Large Watershed. Abstract of a paper by Alexander Porter, read at meeting at Warren, Ohio, to discuss the improvement of the Mahoning River. 2200 w. Eng Rec—Aug. 28, 1909. No. 7383.

The Sanitary Condition of the Southern End of Lake Michigan. J. Herbert Brewster. A study of the pollution of Lake Michigan and the condition of public water supplies, with recommendations for remedying the situation. 7000 w.

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Diagrams. Am W-Wks Assn—June, 1909. No. 5904 N.

See also Cesspools, under MUNICIPAL.

Port Elizabeth.

I. Survey for Port Elizabeth Water-Supply. Charles Dimond Horatio Braine.
II. Port Elizabeth Water-Supply. William Ingham. Two illustrated papers giving a history and description of the water works. 9500 w. Inst of Civ Engrs—No. 3747 & No. 3756. No. 3203 N.

Pumping.

See Pumping Engines, and Pumping Plants, under MECHANICAL ENGINEERING, HYDRAULIC MACHINERY.

Purification.

Importance of the Proper Operation of Water and Sewage Purification Plants. George W. Fuller. Read before the Am. Soc. for Munic. Imp. Outlines features of operation necessary to secure efficiency. 3500 w. Eng Rec—Oct. 31, 1908. No. 26.

The Storage of Raw River Water. Information from the third report of Dr. A. C. Houston to the Metropolitan Water Board, giving results. 1800 w. Engr, Lond—April 9, 1909. No. 4038 A.

The Practical Sterilization of Water and of Sewage Effluents. Read before the Inst. of Munic. Engrs., London. H. C. H. Shenton. Considers the evidence for and against sterilization, the methods and costs. 4500 w. Surveyor—May 7, 1909. Serial, 1st part. No. 4704 A.

The Purification of Water Supplies. John J. Flather. Considers methods in use in various cities, their efficiency, cost, etc. 5500 w. Minn Engr—May, 1909. No. 5562 C.

Water Softening or Purification and Its Saving. M. Miller. Considers methods, results, costs, etc. Ills. 3500 w. Am W-Wks Assn—June, 1909. No. 5910 N.

Water Supply and Purification. T. Aird Murray. Read before the Con. of Munic. of the Prov. of Saskatchewan. Discusses tuberculation and growths in water mains, their prevention and removal; and purification of water by mechanical filtration. 4500 w. Can Engr—Sept. 10, 1909. No. 7687.

Cost of Clearing Water in Settling Basins. S. Bent Russell. Read before the Central States Water-Works Assn. An analysis of costs at St. Louis. 2500 w. Eng Rec—Oct. 16, 1907. No. 8700.

The Cost of Clearing Water in Settling Basins. S. Bent Russell. From a paper before the Cent. States W.-Wks. Assn. Considers four types of settling reservoirs,

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Purification

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with other features and costs. 2200 w. Eng News—Oct. 14, 1909. No. 8562.

The Clarification of Muddy Waters by Natural Decantation and the Automatic Cleaning of Pump Wells (Clarification des Eaux boueuses par Decantation naturelle et Nettoyage automatique des Puisards de Pompes). A. Babonneau. Discusses the application of decantation in coal and ore washing plants, etc., where the recovery of the suspended matter is desired. Ills. Serial. 1st part. Génie Civil—Sept. 4, 1909. No. 8629 D.

The Iron-Lime Process of Water Purification. From a paper by C. Arthur Brown, outlining the conditions which must be satisfied for these materials to be used successfully. 2000 w. Eng Rec—Oct. 9, 1909. No. 8435.

The Electrical Conductivity of Water (Ueber die elektrische Leitfähigkeit natürlicher Wässer). H. Stooff. Discusses how it may be taken advantage of for purification purposes. Ills. 5200 w. Gesundheits-Ing—Jan. 30, 1909. No. 2800 D.

House Apparatus for the Purification of Drinking Water by Ozone (Hausapparate zur Ozonisierung des Trinkwassers). Illustrated description. 1500 w. Elektrochem Zeitschr—Sept., 1909. No. 8647 D.

The Purification of Potable Waters by Ozone (La Stérilisation par l'Ozone des Eaux potables et les Clarificateurs avec Dégrossisseurs biologiques). M. L. Borne. Describes experiences in France. Ills. 7000 w. Mem Soc Ing Civ de France—Dec., 1908. No. 3300 G.

Ozone Purification Plants. S. H. Hart. Describes the J. Howard Bridge process as installed in a small municipal plant in Canada. 2000 w. Elec Rev, N Y—Jan. 9, 1909. No. 1656.

An Ozone Purification Plant at Chartres (Usine de Clarification et d'Ozonation des Eaux de la Ville de Chartres). Augustin Witzig. Illustrated description of a plant serving a city of 23,000 inhabitants. 1000 w. Génie Civil—Nov. 28, 1908. No. 1126 D.

Poughkeepsie Purification Plant. Robert J. Harding. Drawing and description. 1200 w. Cornell Civ Engr—March, 1909. No. 3198 C.

The Sterilization Plant of the Jersey City Water Supply Company at Boonton, N. J. J. L. Leal. Describes the process of water purification. 3500 w. Am W-Wks Assn—June, 1909. No. 5918 N.

Description of Methods of Operation of the Sterilization Plant of the Jersey City Water Supply Company at Boonton, N. J., and Discussion of Results of

Analysis of Raw and Treated Water, with notes on the Cost of the Treatment. George A. Johnson. 3000 w. Am W-Wks Assn—June, 1909. No. 5920 N.

The 40,000,000 Gal. Disinfecting Plant of the Jersey City Water Supply Company, at Boonton, N. J. Abstracts of three papers presented to the Am. W-Wks. Assn., at Milwaukee, June, 1909. J. L. Leal gives the history of the plant; George W. Fuller the nature of the process; George A. Johnson the operation of the plant. Ills. 6000 w. Eng News—June 24, 1909. No. 5868.

Description of the Process and Plant of the Jersey City Water Supply Company for the Sterilization of the Water of the Boonton Reservoir. George W. Fuller. Outlines the more important details. 4500 w. Am W-Wks Assn—June, 1909. No. 5919 N.

The Purification of the Water Supply of Steelton, Pennsylvania. James H. Fuertes. Describes the conditions affecting the design of this plant, its construction, and gives results obtained in operation. Ills. 24500 w. Pro Am Soc of Civ Engrs—Aug., 1909. No. 7366 E.

The Purification of the Water Supply of Steelton, Pa. Discussion of the paper by James H. Fuertes. 2000 w. Pro Am Soc of Civ Engrs—Oct., 1909. No. 8846 E.

The Results of an Examination of the Water Purification Plant at Marietta, Ohio. Philip Burgess gives a description of the plant and its operation, with report of its examination and the recommendations. 4000 w. Eng Rec—Dec. 19, 1908. No. 1058.

Notes Concerning the Water Purification Plant now under Construction for the City of Toledo, Ohio. William G. Clark. Describes the filtration plant. 3000 w. Ohio Soc of Mech Elec & Steam Engrs, No. 142—Nov., 1908. No. 905 N.

The Water Purification Plant at Toledo. William G. Clark. Read before the Ohio Soc. of Mech., Elec. & Steam Engrs. Describes methods used to purify the river water. 3000 w. Eng Rec—Nov. 28, 1908. No. 695.

Water Purification Plant of Toledo. Illustrated detailed description of the plant and its equipment. 4000 w. Munic Jour & Engr—Sept. 1, 1909. No. 7509.

Water Purification at Reading, Pa. An account of tests made with hypochlorite of lime. 1200 w. Eng Rec—Oct. 9, 1909. No. 8442.

Building for the Future. Charles B. Starkey. Illustrated description of the water purification and drainage in the

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Purification

city of New Orleans, La. 2000 w. Dom Engng—Oct. 2, 1909. Serial. 1st part. No. 8291.

The Construction of the Water Purification and Softening Works at New Orleans. Illustrated description of a plant for purifying the Mississippi River water, largely constructed of reinforced concrete. 5800 w. Eng Rec—April 3, 1909. No. 3715.

The Purification of Bubbly Creek, Chicago Stock Yards. A summary of the report by George A. Johnson of tests made of the filter plant for purifying the water. Ills. 4500 w. Eng Rec—Dec. 12, 1908. Serial. 1st part. No. 955.

The Purification of Ground Waters Containing Iron and Manganese. Robert Spurr Weston. Considers the theory and practice of the iron-removal process in use in Europe and America. 18500 w. Pro Am Soc of Civ Engrs—Dec., 1908. No. 1353 E.

The Iron Removal Plant of the Shelby, Ohio, Water Company. Philip Burgess. Report of an examination made of this plant. 3500 w. Eng Rec—Feb. 20, 1909. No. 2566.

The Forbes Water-Sterilizer. Drawings and description. 1600 w. Engng—March 5, 1909. No. 3173 A.

The Toronto Water Purification Works. Illustrated detailed description of the general features. 1500 w. Eng Rec—Sept. 18, 1909. No. 7817.

See also Concrete, under CONSTRUCTION; Sewage Disposal, under MUNICIPAL; and Filtration and Pipe Lines, under WATER SUPPLY.

Rates.

Meter Rates. Walter H. Richards. Discusses the calculation of meter rates. General discussion. 8000 w. Jour N Eng W-Wks Assn—Sept., 1908. No. 663 F.

Water Rates Charged in 375 Cities. D. R. Gwinn. Gives a statement of rates, with the object of showing that the average report gives no accurate information in regard to cost of water furnished. Discussion. 9000 w. Pro Am W-Wks Assn—1908. No. 5935 N.

Water Meter Rates. George B. Bassett. Explains method of adjusting rates. 2500 w. Pro Am W-Wks Assn—1908. No. 5985 N.

What Would Be a Proper Charge for a Service Under These Conditions. S. C. Robinson. A statement of the conditions, with discussion. 6500 w. Pro Am W-Wks Assn—1908. No. 5982 N.

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Collection of Rates. Thomas Stone. Explains methods adopted at Greenville, Pa. 1200 w. Pro Am W-Wks Assn—1908. No. 5942 N.

See also Meters, and Water Works, under WATER SUPPLY.

Reservoirs.

The Principal Reservoirs and Dams of the World. Arthur Lakes. Discussion of various types of dams and notable examples. Ills. 3000 w. Min Wild—June 5, 1909. No. 5376.

Run-Off of Some Representative Streams of the United States. M. T. Rogers and H. U. Ransom. Gives results of a study of stream-flow and run-off in different parts of the United States. Diagrams. 4000 w. Harvard Engng Jour—June, 1909. No. 5990 D.

Methods Used in Preliminary Work on Catskill Reservoirs for a 500-Million Gallon Daily Supply for the City of New York. J. S. Langthorn. A full report of this work, with plans, maps, illustrations and short discussion. 75,000 w. Pro Brooklyn Engrs' Club, No 79—1908. No. 5870 F + F.

Covered Reservoirs. Frank L. Fuller. Gives experience in the use of concrete in their construction and in making them watertight. 1800 w. Jour N Eng W-Wks Assn—June, 1909. No. 6463 F.

A Huge Filtered Water Reservoir for London. Illustrations, with short description. 1000 w. Sci Am—July 3, 1909. No. 6090.

World's Largest Covered Reservoir. An account of the opening of the Honor Oak reservoir. Ills. 1500 w. Surveyor—May 7, 1909. No. 4705 A.

The Construction of the Croton Falls Reservoir. Describes new features and methods developed in the course of recent work on this great reservoir for the supply of New York City. 4500 w. Eng Rec—Dec. 12, 1908. No. 961.

The New Croton Falls Reservoirs. Illustrates and describes interesting details in connection with the 15-billion gallon reservoir for the supply of New York City. 1200 w. Sci Am—May 1, 1909. No. 4329.

Progress on the Ashokan Reservoir. A report of progress on the work in the Catskill Mts. on this reservoir for additional supply of New York City. Ills. 2000 w. Eng Rec—Jan. 16, 1909. No. 1769.

The New High Service Reservoir of the Baltimore Water System. Illustrated detailed description. 2000 w. Eng Rec—Jan. 23, 1909. No. 2027.

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Springfield, Mass.

Two Accidents to Reinforced Concrete Reservoirs. An illustrated account of accidents to reservoirs at Guthrie, and Oklahoma City, and the method of repairing. 1000 w. Eng Rec—June 26, 1909. No. 5998.

The Outlet Control of Little Bear Valley Reservoir. F. E. Trask. Illustrated description of this feature of an important project in California. 1500 w. Pro Am Soc of Civ Engrs—Sept., 1909. No. 8185 E.

See also Failures, under CONSTRUCTION; and Ashokan and Croton, under WATER SUPPLY.

Review of 1908.

Water Supply in 1908. A review of works carried out during the year, and related matters. 2800 w. Engr, Lond—Jan. 1, 1909. No. 1713A.

Run-off.

Yield of Water, Rainfall, Etc., on a Moorland Watershed. S. Hutton. Abstract of paper read before the Inc. Assn. of Munic. & Co. Engrs. Gives results obtained and particulars relating to two watersheds. 1000 w. Engr, Lond—July 16, 1909. No. 6693 A.

Roman Aqueducts.

Gage Measurements of Service Connections of the Ancient Roman Water-Works. M. L. Holman. Testimony to the arithmetical ability and the integrity of the records of the ancient hydraulic engineers. 1500 w. Jour Assn of Engng Socs—June, 1909. No. 7807 C.

Salt Lake City.

Water Supply of Salt Lake City. Abstracts of descriptions of the various sources of supply, particularly of the gravity supply, from a report of Louis C. Kelsey, city engineer. Ills. 2500 w. Munic Engng—March, 1909. No. 2929 C.

San Francisco.

The Water Supply of San Francisco, Cal. C. E. Grunsky. Explains the problems, describing the works now in use and the proposed Tuolumne River project. Maps. 24000 w. Jour Assn of Engng Socs—Sept., 1908. No. 352 C.

Discussion of Paper by C. E. Grunsky, "The Water Supply of San Francisco, Cal." 6500 w. Jour Assn of Engng Socs—Dec., 1908. No. 2416 C.

San Francisco's Efforts to Obtain Municipal Ownership of Its Water Supply. Explains matters relating to the Hetch-Hetchy Valley controversy. Also editorial and letters. Ills. 15000 w. Eng News—Feb. 4, 1909. No. 2279.

Sedimentation Basins.

The Goderich Sedimentation Basin. J. Grant MacGregor. Plan and sections of this basin, with description. 1500 w. Eng Rec—Sept. 4, 1909. No. 7560.

Seepage.

A Seepage Problem in Permeable Soil (Un Problema di Filtrazione di Acqua attraverso un Terreno permeabile). P. Ali-brandi. A mathematical discussion of the rate of filtration of water from irrigation ditches. Ills. 4000 w. Ann d Soc d Ing e d Arch Ital—Aug. 15, 1909. No. 7942 F.

Selection.

The Selection of a Water Supply. Henry N. Ogden. Suggestions of importance in determining the quantity, cost and quality. 3000 w. Pro Am W-Wks Assn—1908. No. 5986 N.

Siphons.

Reinforced Concrete Siphons Across Sosa River and Canyon of Ribabona. B. A. Etcheverry. Illustrates and describes the method of construction. 3000 w. Cal Jour of Tech—Oct., 1909. No. 8760.

Sluice Gates.

The Cast-Iron Sluice Gates for the Fens Gate Chamber, Charles River Basin, Boston, Mass. Walton H. Sears. Illustrated description. 800 w. Eng News—Feb. 25, 1909. No. 2760.

Recent Sluice Design (Neue Schützenkonstruktionen). A. Bühler. Illustrates and discusses mathematically two recent designs. 2000 w. Schweiz Bau—Jan. 30, 1909. No. 2693 B.

Softening.

Is Softened Water a Desirable Municipal Supply? Experience at McKeesport, Pa. A. G. Sandblad. Presented at Cent. States Water Convention. Considers the principal methods of water softening, and the effect of such water on the health of those using it. 2500 w. Eng News—Oct. 21, 1909. No. 8819.

Water Treatment by Electricity. Abstract of a paper by J. L. Campbell before Am. Ry. Engineering and Maintenance of Way Assn., describing experiments in reducing the hardness of water by electricity. 850 w. Elec Age—May, 1909. No. 5430.

See also Locomotive Feed Water, under RAILWAY ENGINEERING, MOTIVE POWER AND EQUIPMENT.

Springfield, Mass.

The Construction of the Little River Water Supply for Springfield, Mass. Illustrated description of important features

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Standpipes

of work now in progress, including intake dam and tunnel, filter plant and settling basin; reservoirs, pipe lines, etc. 5500 w. Eng Rec—Dec. 12, 1908. No. 954.

Standpipes.

See Tanks, under WATER SUPPLY.

Staten Island.

Acquisition by New York City of the Larger of Two Water Systems of Staten Island. Louis L. Tribus. An account of water supply of the island and matters related, giving tables and illustrations. 3000 w. Am W-Wks Assn—June, 1909. No. 5926 N.

Sterilization.

The Practical Sterilization of Water and of Sewage Effluents. H. C. H. Shenton. Read at the Building Trds. Ex. Deals with practical methods of sterilization. 3500 w. Archt, Lond—Aug. 27, 1909. Serial. 1st part. No. 7633 A.

Stream Discharges.

Stream Flow Data. Charles E. Chandler. Gives tables of the flow of the Sudbury River, Nashua River, and Merrimac River, with explanatory notes. 2000 w. Jour N Eng W-Wks Assn—Dec., 1908. No. 1882 F.

Stream Flow.

A Graphic Solution of Kutter's Formula. L. I. Hewes and Joseph W. Roe. Gives a graphic solution of interest to those who deal with canals, flumes and streams. Diagram. 500 w. Bul Am Inst of Min Engrs—May, 1909. No. 5001 F.

Stream Gauging.

Measurement of Water Speed with the Pitot Tube (Ueber die Messung von Wassergeschwindigkeiten mit der Pitotschen Röhre). K. Ellon. Describes the device and its theory. Ills. 2800 w. Zeitschr d ver Deutscher Ing—June 19, 1909. No. 6728 D.

See also same title, under MEASUREMENT.

Tanks.

A Concrete Feed-Water Storage Tank. Warren H. Miller. Directions for building. Ills. 1500 w. Power—Jan. 26, 1909. No. 2090.

The Design of Elevated Tanks and Stand-Pipes. C. W. Birch-Nord. Submits specifications for the approval of engineers. 1500 w. Pro Am Soc of Civ Engrs—March, 1909. No. 3496 E.

The Design of Elevated Tanks and Stand-Pipes. Discussion of the paper by

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Washington, D. C.

C. W. Birch-Nord. 3000 w. Pro Am Soc of Civ Engrs—May, 1909. No. 5109 E.

Water Storage in Elevated Tanks and Stand Pipes. H. E. Horton. Considers the use and advantage of elevated tanks and stand pipes. Discussion. Ills. 6500 w. Jour W Soc of Engrs—June, 1909. No. 5880 D.

A Calculating Chart for the Contents of Cylindrical Tanks. Thomas B. Morley. Gives a chart by which the volume of liquid filling a cylindrical tank to any level may be found without arithmetical calculation. 2000 w. Engng—Sept. 3, 1909. No. 7748 A.

The Klonne Type of High-level Storage Tank. A. Gradenwitz. Illustrated description, explaining the advantages. 600 w. Eng & Min Jour—Oct. 23, 1909. No. 8727.

Failure of Two Iron Water Tanks at Parkersburg, W. Va. William M. Hall. Brief illustrated description of the failure on March 19, 1909. 2000 w. Eng News—April 1, 1909. No. 3760.

Tunnels.

See same title, under CONSTRUCTION.

Typhoid.

A Notable Typhoid Epidemic at Mankato, Minn. F. H. Bass. An account of an epidemic where the artesian water supply was supposed to make contamination impossible. Maps. 1200 w. Eng News—Feb. 11, 1909. No. 2396.

Typhoid Fever and Water-Supply Statistics for 48 New York Cities. Tabulated statistics with a general discussion. 2000 w. Eng News—May 27, 1909. No. 5022.

See also Washington, D. C., under WATER SUPPLY.

Valves.

Hydraulic Gate Valves for the Chicago Water-Works. Brief illustrated description. 700 w. Eng News—May 13, 1909. No. 4648.

Vancouver.

A New Water-Supply for the City of Vancouver, B. C. H. M. Burwell. Illustrated description of the chief features of the Seymour Creek system, now nearing completion. 3000 w. Eng News—April 1, 1909. No. 3756.

Vancouver's Water Supply. An illustrated account of the additional supply obtained from Seymour Creek. 1700 w. Can Engr—Jan. 15, 1909. No. 1774.

Washington, D. C.

Sedimentation of the Water Supply and Its Relation to Typhoid Fever in Wash-

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Water Lift

ington, D. C. Francis F. Longley. A statement of new facts bearing upon this subject. 4000 w. Eng News—April 22, 1909. No. 4160.

The Aqueduct System and Filtration Plant of Washington, D. C. Francis F. Longley. Gives the history and an illustrated description of the works, with costs. 5500 w. Pro Am W-Wks Assn—1908. No. 5984 N.

Water Lift.

Supplying a High-Level Reservoir by the Discharge of a Reservoir at a Lower Level (Alimentation d'un Réservoir surélevé par la Conduite de Refoulement d'un Réservoir inférieur). P. Aristide Bergès. Describes an arrangement by which water is raised by the energy in water at a lower level but without loss. Ills. 2000 w. Génie Civil—June 26, 1909. No. 6550 D.

Water Meters.

Water Meters. J. J. Traill. Illustrates and describes types. 1500 w. Ap Sci—March, 1909. No. 4092 C.

See also Meters, under WATER SUPPLY.

Watersheds.

Yield of Water, Rainfall, Etc., on a Moorland Watershed, and Notes on the New High-Level Water-Works of Exmouth. S. Hutton. Gives details of watersheds supplying Exmouth. 4000 w. Surveyor—Aug. 20, 1909. Serial. 1st part. No. 7429 A.

Water Towers.

The Steel and Concrete Water Tower at Grand Rapids, Mich. Illustrated detailed description of a 885,000-gal. water tower recently erected. 2000 w. Eng Rec—Dec. 12, 1908. No. 956.

A Novel Reinforced-Concrete Tower and Tank. R. B. Tufts. Illustrated description of a structure at Atlanta, Ga. 1500 w. Eng News—Jan. 7, 1909. No. 1642.

Reinforced-Concrete Water Tower for the Atlantic Compress Company, Atlanta. R. B. Tufts. Illustrated detailed description. 1500 w. Eng Rec—Jan. 2, 1909. No. 1421.

A Unique Water Tower. Edward P. Bailey. Illustrated description of a reinforced-concrete tower 185 feet high in the San Bernardino Mts., California. 900 w. Munic Engng—May, 1909. No. 4548 C.

See also Tanks, under WATER SUPPLY.

Water Works.

Water Works of the United States. Information, tabulated data, and sta-

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tistics from 350 plants. 9500 w. Munic Jour & Engr—June 2, 1909. No. 5205.

The American Water-Works Association. Abstracts of the papers read at the Milwaukee convention. 33800 w. Eng Rec—June 19, 1909. No. 5624.

Ownership of Public Utilities. C. W. Wiles. Short paper, introducing general discussion. 2800 w. Pro Am W-Wks Assn—1908. No. 5947 N.

Competitive Water Works. Charles R. Henderson. Considers instances of competition in the business of supplying municipalities with water. Discussion. 3000 w. Pro Am W-Wks Assn—1908. No. 5980 N.

Water-Works Valuation and Fair Rates, in the Light of the Maine Supreme Court. Decisions in the Waterville and Brunswick Cases. Leonard Metcalf. 25000 w. Pro Am Soc of Civ Engrs—Oct., 1908. No. 489 E.

Water-Works Valuation and Fair Rates, in the light of the Main Supreme Court Decisions in the Waterville and Brunswick Cases. Discussion of paper by Leonard Metcalf on this subject. 3500 w. Pro Am Soc of Civ Engrs—Dec., 1908. No. 1355 E.

Water Supply. Muir Edwards. Read at convention of Union of Alberta Municipalities. Outlines the main features of a public supply, discussing the uses, quality, sources of supply, and method of distribution. 4000 w. Can Engr—May 14, 1909. No. 4673.

Some Common Mistakes in the Construction and Maintenance of Water Systems. W. G. Yorston. Read before the Nova Scotia Soc. of Engrs. Discusses briefly the different parts of a water system, calling attention to mistakes in construction. 5000 w. Can Engr—Nov. 6, 1908. No. 154.

A Brief Description of the Cambridge Water Works. History and illustrated description. 3000 w. Harvard Jour of Engng—April, 1909. No. 4932 D.

New Bedford Water Works. Interesting information from the annual report for 1908. Ills. 2800 w. Munic Jour & Engr—April 7, 1909. No. 3795.

The Water Works of West Springfield, Massachusetts. Brief description with plan and sections. 1500 w. Eng Rec—July 10, 1909. No. 6259.

Notes on Newton, N. J., Water Works Construction and Litigation. Louis L. Tribus. Illustrated detailed description of the plant, and account of suits for

CIVIL ENGINEERING

Water-Works Valuation

WATERWAYS AND HARBORS

Antwerp

damages. Discussion. 6000 w. Jour N Eng W-Wks Assn—June, 1909. No. 6460 F.

Water Works of Gary, Ind. Illustrated description of the works of the Gary Heat, Light and Water Co. 1800 w. Munic Jour & Engr—Aug. 18, 1909. No. 7129.

Montreal Water-Works Improvements. Map and illustrated description of work in progress. 1200 w. Engr, London—Dec. 11, 1908. No. 1220 A.

Cowlyd Water-Works. Describes the old and new works. Ills. 2500 w. Surveyor—April 23, 1909. No. 4454 A.

See also Concrete, under CONSTRUCTION; Central Stations, under ELECTRICAL ENGINEERING, GENERATING STATIONS; Accounting, under INDUSTRIAL ECONOMY; and Pumping Plants, under MECHANICAL ENGINEERING, HYDRAULIC MACHINERY.

Water-Works Valuation.

The Valuation for City Purchase of the Property of the Waterloo (Ia.) Water-Works Co. A. Marston. General explanation with abstract of explanatory report. 1600 w. Eng News—April 22, 1909. No. 4158.

Water-Works Appraisements in Missouri and Kansas. Clinton S. Burns. A brief description of nine appraisements made for municipalities. 2200 w. Eng News—July 29, 1909. No. 6769.

Weirs.

The Flow of Water Over Oblique Weir Plates. Results of experiments, by Dr. O. G. Aichel, on the discharge of water over weir plates oblique to the axis of the flowing stream. 1500 w. Eng Rec—July 3, 1909. No. 6174.

The Design of Canal Diversion Weirs on a Sand Foundation. W. G. Bligh. Shows the means adopted to insure the safety of such structures. 5500 w. Can Engr—Oct. 30, 1908. No. 1.

A Segmental Rolling Weir built in 1886 on the Rhone Canal at Cette (Note sur un Système de Fermeture à Segment exécuté en 1886-87 sur le Canal du Rhone à Cette). M. Guibal. Illustrated description. 5600 w. Ann d Ponts et Chauss—1908-IV. No. 1311 E + F.

Recent Reinforced Concrete Weir Construction (Neuere Wehrbauten aus Eisenbeton). F. W. Otto Schulze. Illustrated description and discussion of various structures. Serial, 1st part. 2800 w. Beton u Eisen—April 2, 1909. No. 4895 F.

Rolling Weir and Hydro-Electric Plant of the Lauffen Portland Cement Works at Neckarwestheim, Württemberg (Das Walzenwehr und die Wasserkraftanlage des Württembergischen Portlandzementwerkes Lauffen bei Neckarwestheim am Neckar). Herr Naufer. Gives some details of all the weirs of this type in existence and describes this special installation. Ills. 4400 w. Zeitschr d Ver Deutscher Ing—Nov. 21, 1908. No. 1194 D.

Weir Measurements (Jaugeages par Déversoirs). F. Roussillon. Gives two curves for determining coefficients for free and submerged weirs. Ills. 2000 w. Tech Mod—April, 1909. No. 4831 D.

See also Turbine Plants, under MECHANICAL ENGINEERING, HYDRAULIC MACHINERY.

Well Drillers.

Electric-Driven Well-Driller. J. Vale Downie. Illustrated description of the Keystone electric-driven machine. 1000 w. Min & Sci Pr—Aug. 21, 1909. No. 7375.

Wells.

A Few Examples of Double Wells. F. G. Clapp. Describes wells where two distinct types of water can be obtained from one well; one well gives fresh and also salt water; another fresh and sulphur water. 1500 w. Eng Rec—Feb. 20, 1909. No. 2567.

Methods of Deep Well Drilling in the Gulf of Mexico Coastal Plain. Illustrates and describes a number of methods used. 1500 w. Engng-Con—April 7, 1909. No. 3871.

See also Newton, Mass., under WATER SUPPLY.

Youngstown, O.

An Industrial Water Supply for the Youngstown District. Explains conditions and illustrates and describes the project carried out which will impound two billion gallons in three lakes, giving a head of 160 feet. 1800 w. Ir Trd Rev—Dec. 17, 1908. No. 1037.

WATERWAYS AND HARBORS

Antwerp.

The Antwerp Harbor Works (Note sur les Travaux du Port d'Anvers). A. Alby. Illustrated description of recent work. 5300 w. Mem Soc Ing Civ de France—Oct., 1908. No. 1306 G.

The New Harbor Works at Antwerp (Die neuen Hafenanlagen von Antwerpen). W. Kaemmerer. Illustrated description of a sea wall, a new lock, and other works. 3300 w. Zeitschr d Ver Deutscher Ing—June 5, 1909. No. 6720 D.

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Baltimore

WATERWAYS AND HARBORS

Canals

Baltimore.

New Harbor Works at Baltimore. Illustrated detailed description of the work of reconstruction since the fire. 2000 w. Engr, Lond—Jan. 29, 1909. No. 2367 A.

Baltimore's Municipal Dock Improvements. William H. Stone. An illustrated description of work to improve the port facilities. 2500 w. Mfrs' Rec—May 27, 1909. No. 5008.

See also Piers, under WATERWAYS AND HARBORS.

Barcelona.

The Port of Barcelona (Le Port de Barcelone). M. Batard Razelière. Discusses its status, works in progress and projected, administration, facilities for handling freight, etc. Ills. 26000 w. Ann des Ponts et Chauss—1908-IV. No. 1308 E + F.

Barge Canal.

The New York Barge Canal. Theron M. Ripley. Brief review of the history and progress of this project. Ills. 4000 w. Jour Assn of Engng Socs—Feb., 1909. No. 3963 C.

Construction Work on the New York State Barge Canal. Illustrated description of work on a number of contracts, the dredging and excavating equipment, methods, dams, locks, etc. 19600 w. Eng Rec—April 3, 1900. No. 3712.

The Excavating and Dredging Outfit on the Oneida River Section, Contract No. 12, of the New York State Barge Canal. Extract from the Barge Canal March Bulletin, 1909. Describes the conditions and the equipment for carrying out the work. 4000 w.—Eng News—July 29, 1909. No. 6768.

Breakwaters.

See Sea Walls, under WATERWAYS AND HARBORS.

Bridge Piers.

The Damming Effect of Bridge Piers in Waterways (Einige Untersuchungen im Staubeite eines Wasserlaufs bei Brückeneinbauten). W. Plenkner. A mathematical discussion. Ills. 5500 w. Oest Wechenschr f d Oeffent Baudienst—Jan. 2, 1909. No. 2814 D.

Buoys.

Aids to Navigation Near Belle Isle. P. E. Parent. Considers buoys, lighthouses, fog alarms, etc., as used in the Quebec District. Ills. 5500 w. Can Engr—Sept. 3, 1909. No. 7546.

See also Lightships, under MARINE AND NAVAL ENGINEERING.

Caissons.

Concrete-Steel Caissons: Their Development and Use for Breakwaters, Piers and Revetments. W. V. Judson. Illustrated description of harbor work at Milwaukee, Wis., with reports of tests and description of Algoma caisson work. Discussion. 16800 w. Jour W Soc of Engrs—Aug., 1909. No. 7424 D.

Methods Employed in Computing Reinforced Concrete Caissons for Algoma Breakwater. Gives methods of computing the caisson wells and bottoms, and some tests on beams. 1500 w. Engng-Con—Aug. 18, 1909. No. 7134.

See also same title, under CONSTRUCTION.

Calumet River.

See Great Lakes, under WATERWAYS AND HARBORS.

Canada.

Canada and Her Waterways. J. G. Sing. Remarks on the extent of Canada, the importance of the waterways, their recent improvement, and work in progress. 3000 w. Can Engr—Jan. 22, 1909. No. 2016.

Canal Haulage.

See same title, under STREET AND ELECTRIC RAILWAYS.

Canals.

The Relation of Railways to Canals. John F. Stevens. Extract from a paper read before the Atlantic Deeper Waterways Assn. Gives arguments favoring a canal system constructed by the National Government. 1200 w. Eng News—Dec. 10, 1908. No. 938.

A Method for Determining the Most Economical Sections for Canals. A. L. Dabney. Diagrams constructed to show within what limits the ratio of bottom width to depth of flow may be varied without loss of economy and efficiency. Tables. 1000 w. Engng-Con—Sept. 15, 1909. No. 7798.

Progress in Inland Navigation. Editorial on conditions and work in progress in different countries. 1800 w. Engng—May 7, 1909. No. 4727 A.

The Crossing of Rivers at Constant Level by Navigable Canals (Sull' Attraversamento, a Livello costante, dei Fiumi con Canali navigabili). Mario Majocchi. A discussion of various arrangements. Ills. 3000 w. Monit Tech—April 10, 1909. No. 4846 D.

Abandoned Canals of the State of New York. Ely Van de Warker. An illustrated review, discussing the mistake of

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Canals

their abandonment. 2500 w. Pop Sci M—Sept., 1909. No. 7783 C.

Widening the American Canal at Sault Ste. Marie. Illustrated description of work in progress by the United States government. 3500 w. Eng Rec—Sept. 11, 1909. No. 7667.

The Cape Cod Ship Canal. Brief illustrated account of this canal now under construction, between Barnstable Bay and Buzzard's Bay. 1500 w. Eng. Rec—July 24, 1909. No. 6645.

The Sanitary District of Chicago, and the Chicago Drainage Canal: A Review of 20 Years of Engineering Work. Isham Randolph. With colored map, profile, and cross-sections. 9000 w. Eng News—July 22, 1909. No. 6618.

The North Shore Channel of the Sanitary District of Chicago. Methods and Cost of Constructing Section One. 2000 w. Engng-Con—Aug. 4, 1909. No. 6899.

The Canals of Canada. Gives statistics relating to cost of construction, some traffic comparisons, etc. 1000 w. Can Engr—June 18, 1909. No. 5611.

The Proposed National Ship Canal in Scotland. Maps with descriptive account of a proposed ship canal from the North Sea to the Atlantic sea-board. 3000 w. Engng—April 23, 1909. No. 4463 A.

The Marne-Saône Canal (Le Canal de la Marne à la Saône). O. Jacquinot. The first part describes its position as a part of the French system of inland waterways, discusses its history and begins a description of the canal works. Ills. Serial. 1st part. 4500 w. Génie Civil—Oct. 10, 1908. No. 534 D.

Repair of the Chazilly Conduit of the Bourgogne Canal with Reinforced Concrete (Sur la Réfection de la Rigole de Chazilly du Canal de Bourgogne au Moyen de Chapes en Béton Armé). M. Hégly. Illustrated description of a reinforced-concrete lining applied to a trench supplying water to the Chazilly reservoir. 3000 w. Ann d Pcnts et Chaussées—1908-III. No. 503 E + F.

Plans of Bavaria and Württemberg for a Canal to Join the Rhine and the Danube (Die bayerischen und württembergischen Canalpläne für Donau-Rhein-Verbindungen). Herr Steller. A brief review. Ills. 3600 w. Zeitschr d Ver Deutscher Ing—Feb. 13, 1909. No. 3565 D.

The Project for a Main-Danube Ship Canal (Der Stand der Planung für die Main-Donau Grossschiffahrtsstrasse). Herr Gebhardt. A discussion of the present

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state of the plans. Ills. Serial, 1st part. 1400 w. Deutsche Bau—July 7, 1909. No. 7278. B.

The Gent-Terneuzen Canal (Het kanaal van Gent naar Terneuzen). Ar R. van Loon and N. C. Lambrechtsen. Illustrated description of this waterway in Holland. 6000 w. Ingenieur—July 24, 1909. No. 7482 D.

Eleventh International Navigation Congress, St. Petersburg, 1908 (XI^e Congrès international de Navigation tenu à Saint-Petersbourg en 1908). Report of the discussion on combined navigation and irrigation canals. 16000 w. Ann d Ponts et Chaussées—1909-IV. No. 7915 E + F.

See also Excavation, under CONSTRUCTION; Aqueducts, under WATER SUPPLY; Barge Canal and Panama Canal, under WATERWAYS AND HARBORS; and United States, under RAILWAY ENGINEERING, MISCELLANY.

Chicago.

Report to the Chicago Harbor Commission on Obstacles to Chicago's Water Shipping Development. Abstract of report by George C. Sikes. 8000 w. Marine Rev—Jan. 28, 1909. Serial. 1st part. No. 2164.

Report of the Chicago Harbor Commission. Extracts covering important points of the recent exhaustive report concerning harbor facilities in the lake and river at Chicago. 4000 w. Ry & Engng Rev—March 20, 1909. No. 3295.

The Engineering, Commercial and Administrative Problems of Harbor Development at Chicago. Editorial review of report of a commission to investigate the facilities and the relations of the harbor to the railway terminals. 3500 w. Eng News—April 29, 1909. No. 4363.

Cleveland, O.

Recent Improvements to the Harbor. at Cleveland, Ohio. Illustrated description of breakwater extensions, and changes, channel deepening, and other important changes. 1500 w. Eng Rec—Jan. 16, 1909. No. 1766.

Coast Erosion.

Erosion of the Coast and Its Prevention. F. W. S. Stanton. An appendix to previous articles. Deals with the Thames estuary. Ills. 2500 w. Pub Works—Jan-March. 1909. No. 5644 D.

Coast Protection.

The Execution of Coast Protection Works in Reinforced Concrete (Die Ausführung von Seesenkwerken aus Eisen-

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Cofferdams

beton). Robert de Mural. Describes the author's system. Ills. Serial. 1st part. 1800 w. Beton u Eisen—Jan. 8, 1909. No. 2820 E.

Reclamation and Development of the New Jersey Coast. George L. Watson. Describes reclamation of meadowland and beach protection at Five Mile Beach, New Jersey. Ills. 2500 w. Can Soc of Civ Engrs—April 15, 1909. No. 4320 N.

Cofferdams.

Steel Piling at Power-House Intakes at Omaha. Describes intakes constructed under difficult conditions by handling the work in cofferdams of steel sheet piling. 1000 w. Eng Rec—Jan. 2, 1909. No. 1423.

The Black Rock Lock Cofferdam. Illustrates and describes the construction at Buffalo, N. Y., of an unbraced steel and puddle cofferdam in which a concrete ship lock will be constructed. 2200 w. Eng Rec—April 3, 1909. No. 3694.

Colorado River.

The Colorado River Breach and Closure. An illustrated account of the break in 1906, that flooded the Salton Basin, and the attempts and final success in closing it. 2500 w. Engr, Lond—April 9, 1909. No. 4037 A.

Costa Rica.

See same title, under RAILWAY ENGINEERING, MISCELLANY.

Detroit River.

The Improvement of the Detroit River for Navigation. Map and illustrated description of work in progress. 4000 w. Eng News—Dec. 17, 1908. No. 979.

Progress on the Improvement of the Detroit River. Describes the work of increasing the channel depth, the methods employed, etc. 5700 w. Eng Rec—April 3, 1909. No. 3703.

Dikes.

A Concrete-Pile Dike for River Bank Revetment. Describes test work constructed near Ellwood, Kansas, giving cost. 1000 w. Eng Rec—Jan. 23, 1909. No. 2025.

Diving.

Submarine Experiments of the Past. Franz M. Feldhaus. Illustrates and describes early devices to enable men to work under the water. 1500 w. Sci Am Sup—March 20, 1909. No. 3581.

See also Fire Protection, under WATERWAYS AND HARBORS.

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Diving Bells.

A New Application of the Diving Bell. Illustrated description of a diving-bell or portable caisson constructed for the German Navy Department for use in deepening the harbor at Tsingtau. 500 w. Sci Am—Aug. 21, 1909. No. 7148.

Docks.

Harbor and Dock Improvements. Illustrates and describes recent work at the port of New York. 1000 w. Sci Am—Dec. 5, 1908. No. 816.

New Colman Dock at Seattle. H. Cole Estep. Illustrated description of a new dock 700 ft. long, costing about \$1,000,000. 2000 w. Marine Rev—Dec. 3, 1908. No. 822.

A Structural-Steel Ore Dock at Two Harbors, Minn. Illustrated detailed description of a 50000-ton ore dock, the first of its kind to be erected in the United States. 2200 w. Eng Rec—Dec. 5, 1908. No. 831.

A Large Coal Dock at Duluth. Illustrated description of dock and equipment for unloading from vessels and delivering to storage and cars the fuel supply of the D., M. & N. Ry. and the numerous large iron-ore mines operated along the line. 3500 w. Eng Rec—Oct. 23, 1909. No. 8701.

A Heavy Concrete Dock on the Cuyahoga River, Cleveland. Explains conditions and illustrates and describes the dock. 1500 w. Eng Rec—April 3, 1909. No. 3711.

The Key Harbor Ore Docks of the Canadian Northern Railway. E. W. Oliver. Illustrates and describes the ore dock, a conveyor trestle and an unloading trestle. 1200 w. Eng Rec—March 20, 1909. No. 3275.

Keyham Dockyard Extension. Sir Whately Eliot. Brief review of the history of this dockyard, with illustrated description of works constructed since 1896. Keyham Dockyard and Extension; Temporary Works, and Plant and Appliances Used in Construction. George Hall Scott. Two papers discussed together. Plates. 38500 w. Inst of Civ Engr—Papers 3701 & 3728. No. 890 N.

Immingham Docks. Illustrated description of the extensive new dock works of the Great Central Ry. Co., on the Humber River. Also editorial. Plate. 5000 w. Engng—May 14, 1909. Serial, 1st part. No. 4959 A.

Iron Ore Docks at Aguilas, Spain. Gustave Gillman. From a paper before the Inst. of Civ. Engrs., London. Illustrates

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Dock Yards

and describes steel docks resting on concrete blocks. 2000 w. *Ir Age*—March 25, 1909. No. 3483.

Dockyards.

See Shipbuilding, under MARINE AND NAVAL ENGINEERING.

Dover.

The Admiralty Harbor at Dover. Illustrated description of the completed works and their construction. Plates. 5000 w. *Engng*—Oct. 15, 1909. No. 8896 A.

Dredges.

The New Jomini River Dredge (Nouvelle Drague de Rivière Système N. Jomini). M. Lidy. Description of a screw device for levelling river bottoms, which is turned by the force of the current. Ills. 2500 w. *Ann d Ponts et Chaussées*—1908-VI. No. 3318 E + F.

See also same title, under MARINE AND NAVAL ENGINEERING.

Dredging.

Methods and Costs of Dredging the St. Lawrence River. Describes the work and the outfit used, the methods of dredging, and gives itemized cost. 5000 w. *Engng-Con*—Nov. 4, 1908. No. 241.

Bucket Dredging and Pump Sluicing. H. Herman. Considers their applicability and costs. 2000 w. *Aust Min Stand*—Nov. 18, 1908. No. 1096 B.

Memoranda on Dredging in Ambrose Channel, New York Harbor. H. L. Wigmore. From a paper in *Prof. Mem.*, Engr's Bureau, U. S. Army. Describes the work and plant and gives tabulated data of operating records. 1500 w. *Eng News*—Aug. 26, 1909. No. 7361.

Rock Removal in Hell Gate, New York City. Describes present conditions and the work in progress for the improvement of this dangerous channel. Ills. 4000 w. *Eng Rec*—Aug. 21, 1909. No. 7307.

The Hydraulic Transmission of Dredged Materials at San Pedro Harbor, Cal.; A Record of Performance. H. Hawgood. Detailed description of methods used in filling and reclaiming submerged lands. Ills. 3300 w. *Eng News*—Sept. 2, 1909. No. 7535.

Dredging and the Removal of Submarine Rock at Malta. (Abridged.) Arthur Langtry Bell. Describes the rock-breaking appliances, dredging craft, etc., used in deepening and extending the berthing area for warships. Ills. 4500 w. *Inst of Civ Engrs*—No. 3762. No. 3206 N.

See also Barge Canal, and Rangoon, under WATERWAYS AND HARBORS; and

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Estuary Channels

Dredges, under MARINE AND NAVAL ENGINEERING.

Dry Docks.

The Dry Dock. T. M. Brown. Reviews the history of their development, and gives information of interest. 4000 w. *Marine Rev*—March 11, 1909. No. 3122.

The Graving Docks of the World. N. G. Gedye. This first article of a series deals principally with the graving docks of Great Britain, discussing size. 2000 w. *Engr, Lond*—April 30, 1909. Serial. 1st part. No. 4629 A.

The Stability of Floating Docks. Bernard C. Laws. An illustrated article considering the equilibrium of single- and double-walled docks. 1500 w. *Cassier's Mag*—Oct., 1909. No. 8463 B.

Floating or Stationary Dry Docks (Schwimmdock oder Trockendock). Herr Thalenhorst. A discussion of their relative advantages in various situations. Ills. 3300 w. *Zeitschr d Ver Deutscher Ing*—March 27, 1909. No. 4298 D.

A 6000-Ton Floating Drydock. William T. Donnelly. Illustrated description of a recently completed pontoon floating drydock having a number of new features. 3000 w. *Int Marine Engng*—Aug., 1909. No. 7118 C.

The Great Drydock at Pearl Harbor, Hawaii. Elmer Murphy. Describes this drydock, which is the largest ever constructed by the U. S. Navy Department. 1000 w. *Sci Am*—Feb. 6, 1909. No. 2283.

Floating Dry Docks for the Oregon Dry Dock Co. Drawings and details of construction of a medium-sized dock to meet stated conditions. Ills. 1000 w. *Marine Rev*—Sept., 1909. No. 7723.

Extension of Malta Naval Dockyard and Harbor. Maps, plans and illustrated detailed description of new works which have cost nearly three millions sterling. Plates. 6000 w. *Engng*—Jan. 1, 1909. Serial. 1st part. No. 1704 A.

An Off-Shore Floating Dock for Penarth. Illustrated description of a dock built at Cardiff. 400 w. *Engr, Lond*—Sept. 24, 1909. No. 8368 A.

12,000-Ton Pontoon Floating Dock for Kobe. Drawings and brief description of a recently completed dock for use in Japan. 300 w. *Engr, Lond*—Sept. 3, 1909. No. 7760 A.

See also same title, under ELECTRICAL ENGINEERING, POWER APPLICATIONS.

Estuary Channels.

Estuary Channels and Their Treatment. Brysson Cunningham. Describes the ade-

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Famagusta

quate maintenance of these approach channels to meet the requirements of modern commerce. Ills. 4500 w. Engng—Oct. 30, 1908. Serial. 1st part. No. 189 A.

Famagusta.

Famagusta Harbors, Cyprus. George Hobbs. Illustrated description of recent work for the improvement of this ancient port. 3000 w. Inst of Civ Engrs—No. 3782. No. 8160 N.

Ferry Houses.

The Municipal Ferry House Substructure, New York. Illustrates and describes the fireproof steel structure at Battery Park which is to accommodate all the municipal ferries located at this point. 4000 w. Eng Rec—Nov. 7, 1908. No. 143.

Superstructure of the Liberty Street Ferryhouse, New York. Plans and description of this passenger terminal of the C. R. R. of N. J. 1500 w. Eng Rec—May 29, 1909. No. 5147.

Finland.

See same title, under RAILWAY ENGINEERING, MISCELLANY.

Flood Prevention.

See Irrigation, under WATER SUPPLY.

Flood Protection.

Paxton Creek Flood Controlling Works, Harrisburg, Pennsylvania. R. M. Riegel. Illustrated detailed description of flood prevention works, and their construction. 3500 w. Cornell Civ Engr—Oct., 1909. No. 8839 C.

Flood Protection in Grand Rapids, Mich. An account of the extensive scheme for protection from floods in the Grand River. Ills. 5000 w. Eng Rec—Oct. 31, 1908. No. 25.

Flood Protection in the Kansas River Valley at Kansas City. J. Y. Olesen. Gives recommendations for flood protection, taken from the Army Engr's report, and H. N. Pharr's report. 3000 w. Eng News—July 15, 1909. No. 6387.

Flood Protection for Breslau (Hochwasserschutz für Breslau). Herr Wannenovius. Discusses the problem and its solution. Ills. Serial, 1st part. 1800 w. Deutsche Bau—July 14, 1909. No. 7279 B.

Floods.

The Floods of the Mississippi Delta; Their Causes, and Suggestions as to Their Control. William D. Pickett. 7800 w. Pro Am Soc of Civ Engrs—Nov., 1908. No. 647 E.

High-Water Marks. Francis W. Blackford. An illustrated account of destruc-

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French West Africa

tion caused by unusually high water in Mexico. 700 w. Jour Assn of Engng Socs—Feb., 1909. No. 3964 C.

The Recent Floods at Monterey, N. L., Mexico. G. R. G. Conway. An illustrated report of a disastrous flood with record of rainfall. Editorial. 2200 w. Eng News—Sept. 23, 1909. No. 8016.

The Monterey Flood and San Luisito Bridge. Samuel J. Lewis. An account of the flood of Aug. 27th last in the Santa Catarina River and the damage done, especially its effect on this reinforced-concrete bridge. Ills. 1800 w. Min & Sci Pr—Oct. 9, 1909. No. 8733.

The Eger Flood and Ice Shove (Die Hochwasserkatastrophe und Eissprengen an der Eger im Postelberger Bezirk). Wenzel Werner. Illustrated description of the damage and of the temporary relief works. Ills. 2200 w. Oest Wochenschr f d Oeffent Baudienst—Aug. 7, 1909. No. 7987 D.

France.

France's Investment in Marine Transport Facilities, Harbors and Canals (Mise au Point de notre Outillage Maritime—Ports et Canaux). M. G. Hersent. An exhaustive discussion of marine and inland water transport in its relation to French industry. Ills. 28000 w. Bul Soc d'Encour—Oct., 1908. No. 518 G.

The Great Deficiency in the Inland Waterways System of France. (Les grandes Lacunes du Réseau navigable de la France). F. Arnodin. Compares water with rail transport and shows the importance of canal competition. 3500 w. Génie Civil—Jan. 30, 1909. No. 2646 D.

French Commercial Harbors (Nos Ports de Commerce). C. Boutillier. A discussion of their condition, improvements necessary and the means whereby they can be realized. 7000 w. Tech Mod—June, 1909. No. 6537 D.

Frankfort-on-Main.

The Harbor Works of Frankfort-on-the-Main. Detailed description of the completed and proposed works. 2500 w. Pub Works—Oct.-Dec., 1908. No. 3595 B.

Fremantle.

The New Fremantle Harbor (Le Nouveau Port de Fremantle). Paul Privat-Deschanel. Describes recent improvements. Map. 1500 w. Génie Civil—Nov. 7, 1908. No. 1120 D.

French West Africa.

Harbors and Rivers of French West Africa (Les Ports et les Fleuves de l'Afrique occidentale Française). Illus-

CIVIL ENGINEERING

Great Lakes

WATERWAYS AND HARBORS

Italy

trated description of harbors and navigable waterways and a discussion of commercial possibilities. 9000 w. *Rev Gen des Sci*—Dec. 15, 1908. No. 1916 D.

Great Lakes.

The Low Stage of Lakes Huron and Michigan. C. E. Grunsky. A study of the effect of water storage in Lake Superior upon the water elevation in Lakes Huron and Michigan, and a discussion of the causes of the low stages. 5500 w. *Pro Am Soc of Civ Engrs*—Oct., 1908. No. 487 E.

The Effect of the Proposed Calumet Canal on the Levels of the Great Lakes. Reports the testimony given in the case before the U. S. Courts in regard to a proposed canal which will reverse the flow of the Calumet River and so lower the level of Lake Michigan. 2500 w. *Eng News*—May 27, 1909. No. 5019.

Georgian Bay Canal.

The Georgian Bay Ship Canal. J. G. G. Kerry. Reviews the history of this project and gives an outline of the projected route. 4000 w. *Engineering Magazine*—Jan., 1909. No. 1326 B.

The Georgian Bay Ship Canal. J. G. G. Kerry. An interesting discussion of the economic and financial elements of the undertaking, and some engineering details relating to water-supply at the summit. 2500 w. *Engineering Magazine*—Feb., 1909. No. 2159 B.

Description and Cost Estimates of the Proposed Georgian Bay Ship Canal. Maps, sections and description as given in an "interim report" of the project. 3000 w. *Eng News*—Feb. 25, 1909. No. 2754.

Canadian Routes for Deep Waterways to the Atlantic. Brief discussion of the St. Lawrence route as compared with the Georgian Bay project. 1200 w. *Eng News*—March 4, 1909. No. 2998.

Great Britain.

Railways and Waterways. G. R. Jebb. Report for Great Britain on the influence of waterways, considered as feeders and competitors of railways. 5500 w. *Bul Int Ry Cong*—Aug., 1909. No. 8028 G.

Harbor Pollution.

The Discharge of Sewage into Tidal Waters. George A. Soper. Discusses the sanitary protection of tidal harbors. 6000 w. *Sch of Mines Qr*—April, 1909. No. 5900 D.

See also Sewage Disposal, under MUNICIPAL.

Harbors.

The Influence of Recent Developments in Size and Speed of Steamships on Port and Harbour Accommodation. Brysson Cunningham. A discussion of some of the problems affecting modern shipbuilding and port accommodations. Ills. 3500 w. *Cassier's Mag*—Dec., 1908. No. 950 B.

Building a Harbor. Charles F. Holder. Remarks on the lack of safe harbors on the Californian Coast, with illustrated description of government work in progress at San Pedro. 1200 w. *Int Marine Engng*—April, 1909. No. 3683 C.

Some Experiences With Tides and Waves. H. A. Russell. Relates some experiences in building upon sands in harbor work. 3500 w. *Can Engr*—April 9, 1909. No. 3878.

Modern Ships and Harbor Accommodations (Navires et Ports d'Aujourd'hui). Robert Hecker. A description of measures taken in some European ports, including Antwerp, Rotterdam, Havre, Bremerhaven, Southampton and Bremen, to insure the access of the largest of modern ships. Ills. 15000 w. *Ann d Ports et Chaussées*—1909-III. No. 7212 E + F.

Hamburg, Antwerp and Other European Harbors (Los Puertos de Hamburgo, Amberes y varios otros de Europa). Review of a publication by the Brazilian Minister of Public Works describing large European harbors and discussing the application of their principles of construction to the port of Buenos Ayres. Ills. Serial. 1st part. 4000 w. *Ingenieria*—Nov. 15, 1908. No. 1939 D.

Hungary.

Hungarian Waterways (Die Wasserstrassenaktion in Ungarn). Carl Grünhut. Gives in tabular form details of present and projected canals in Hungary. Plates. 5500 w. *Oest Wochenschr f d Oeffent Baudienst*—Dec. 5, 1908. No. 1974 D.

Ice Jams.

Extraordinary Ice Jams at Niagara Falls. An illustrated account of the unusual conditions in February and the blasting to break the glacier. Plate. 2800 w. *Eng News*—April 29, 1909. No. 4355.

Italy.

The Development of Internal Navigation in Italy in Relation to the Operation of Railways and Tramways and to National Economy (Considerazioni intorno agli Studi ed ai Mezzi per Sviluppare le Navigazione interna in Relazione coll' Esercizio delle Ferrovie e Tramvie e il

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Jetties

Completamento dei Mezzi di Trasporto nell'Interesse dell'Economia Nazionale). Serial. 1st part. 7000 w. Ing Ferro—July 1, 1900. No. 7248 D.

Jetties.

A Complicated Reinforced Concrete Jetty-Head, Thames Haven, Eng. Views and short description. 700 w. Eng News—April 22, 1909. No. 4165.

Kanawha River.

A Defence of the Present System of Improvements on the Kanawha River. F. W. Altstaetter. Gives results of a study of this watershed, showing that reservoir regulation would have been very costly and accomplished nothing more than the existing improvements. Editorial. 7500 w. Eng Rec—Feb. 13, 1909. No. 2447.

Lake Ontario.

Currents and Shore Processes in Lake Ontario. Alfred W. G. Wilson. Special reference to Toronto harbor. 4500 w. Can Engr—March 26, 1909. No. 3535.

Levees.

The McGee Creek Levee and Drainage District of Pike and Brown Counties, Illinois. A. H. Bell. Read before the Ill. Soc. of Engrs. & Surv. Describes the construction of works for protection from overflows and for drainage of the land. 1200 w. Eng Rec—Feb. 20, 1909. No. 2570.

Lighthouses.

The Guiding Lights of Our Coasts. C. H. Claudy. Gives a diagram showing the relative intensities of lights of different orders and different characters, with other information regarding lamps and light-houses. Ills. 1000 w. Sci Am—Nov. 28, 1908. No. 473.

The Substructure for the White Shoal Light, Lake Michigan. Explains conditions to be met in the construction of a lighthouse at the extreme northern end of Lake Michigan, and the methods adopted. Ills. 2200 w. Eng Rec—June 12, 1909. No. 5484.

The Cayo Caiman Grande Lighthouse, Cuba. Illustrated description of a steel structure nearly 150 feet high, carrying a watch-room and lantern and enclosing a keeper's house at ground level. 900 w. Eng Rec—Aug. 14, 1909. No. 7073.

An Open-Sea Ferro-Concrete Lighthouse. Illustrated description of a recently completed structure in the Straits of Malacca, and of the methods and difficulties of construction. 1000 w. Prac Engr—Nov. 6, 1908. No. 303 A.

WATERWAYS AND HARBORS

Locks

The One Fathom Bank, Ferro-Concrete Lighthouse, Straits Settlements. Alexander Murray, in *Colonial Office Journal*. Illustrated description of a structure in the Straits of Malacca. 1800 w. Cement Age—March, 1909. No. 3450.

Automatic Flash-Light Acetylene Lamp for Lighthouses (Lampe à Acétylène à Allumage et à Extinction automatiques pour Feux à Eclats). Emil Smith. Illustrated detailed description. 1800 w. Génie Civil—Feb. 13, 1909. No. 3342 D.

See also Buoys, under WATERWAYS AND HARBORS.

Liverpool.

Barriers to International Trade. Lewis M. Haupt. An illustrated description of harbor problems at the port of Liverpool is given. A second paper will discuss the harbor of New York. 4000 w. Cassier's Mag—April, 1909. Serial. 1st part. No. 3639 B.

Lock Gates.

The Design of the Lock Gates and of an Emergency Dam for the Panama Canal. Information from the recent report of the Isthmian Canal Commission in regard to the design of these lock gates and the dam. 1000 w. Eng News—Dec. 31, 1908. No. 1408.

The Lock Gates of the Panama Canal. Drawings and description. 1500 w. Eng News—Sept. 16, 1909. No. 7897.

An Attempt to Destroy Canal Lock-Gates by Dynamite. An account of an attempt made in 1900 to injure gates on the Welland Canal. 700 w. Eng News—July 1, 1909. No. 6083.

Hydraulically Operated Lock Gates at Meppen, Dortmund-Ems Canal (Commande Hydraulique des Portes l'Ecluse de Meppen, Canal de Dortmund à l'Ems). Illustrated description. 2000 w. Génie Civil—June 26, 1909. No. 6551 D.

Locks.

The Locks of the Panama Canal. An illustrated article reporting the progress of lock excavation and describing the lock structures. 5000 w. Eng News—July 15, 1909. No. 6382.

Constructing the Concrete Locks of the Panama Canal. H. Prime Kieffer. Illustrates and describes the methods of construction and the material-handling plants. 2000 w. Sci Am—July 17, 1909. No. 6334.

The Lock in the Mississippi River at Moline, Ill. Illustrated description of the lock and its construction, explaining con-

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Locks

ditions. 3000 w. Eng Rec—Jan. 30, 1909. No. 2178.

Lock No. 3, Cumberland River. William W. Harts. An illustrated description of this work, with costs. 1000 w. Eng News—May 6, 1909. No. 4523.

A Movable Lock for Inclined Canals. H. Prime Kieffer. Illustrated description of a self-propelled canal-lock, invented by Giuseppe Bartolomei. 1200 w. Sci Am—March 6, 1909. No. 2968.

Mechanical Ship-Lifts (Ueber Schiffshebewerke mit Schraubenführung). Fr. Lebens. Describes lift locks operated by screws. Ills. 2000 w. Deutsche Bau—June 12, 1909. No. 6576 B.

Electrical Installations at the Locks of Port-à-l'Anglais (Installations électriques aux Ecluses le Port-à-l'Anglais). M. Imbs. Detailed description of the electrically operated lock gates, sluices, etc. Ills. Plates. 7200 w. Ann d Ponts et Chaussées—1909-III. No. 7211 E + F.

The Floride Lock at Havre (Note sur les Travaux de Construction de l'Ecluse à Sas de la Floride au Port du Havre). M. Guiffart. Illustrated detailed description of the construction of this important part of the harbor-improvement work. 30000 w. Ann d Ponts et Chauss—1908-V. No. 2608 E + F.

The Accident to the Lock Gates at the Canadian Canal, Sault Ste. Marie. Illustrated account of the wrecking of the lower gates of the lock of the Canadian Canal, on June 9, 1909. 1200 w. Eng News—June 17, 1909. No. 5581.

The Accident at the Canadian Lock at Sault Ste. Marie. Gives details of the accident and the methods of closing the canal, with illustrations. 2500 w. Eng Rec—June 19, 1909. No. 5625.

Accident at Sault Ste. Marie. Illustrated description of the recent accident in which the lock gates were carried away. 1500 w. Marine Rev—July, 1909. No. 6322.

The Accident on the Sault Ste. Marie Canal. Editorial on the recent accident which carried away the lock-gates of the Canadian Canal. 2000 w. Engng—July 9, 1909. No. 6425 A.

The Lessons of the Soo Lock Accident. Editorial discussion of the cause of the accident, and its effect upon the judgment as to the Panama Canal. 2000 w. Eng Rec—June 26, 1909. No. 5995.

A Suggestion of a Type of Lock for the New Government Canal at Sault Ste. Marie—Including a Criticism of the Present Poe Lock. George A. Burley.

WATERWAYS AND HARBORS

Niagara River

Map and Ills. 5500 w. Eng News—June 24, 1909. No. 5865.

See also Dams, under WATER SUPPLY; Barge Canal, and Panama Canal, under WATERWAYS AND HARBORS; and Cranes, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING.

Manitowoc, Wis.

The Improvement of Manitowoc Harbor, Wisconsin. Illustrated description of reconstruction work to meet modern conditions. Cribs from the old works are removed to the new. 2500 w. Eng Rec—Jan. 23, 1909. No. 2024.

Milan.

A Project for a New Port at Milan (Il Progetto del nuovo Porto di Milano). A discussion of the project, the difficulties and problems to be solved. Ills. 4000 w. Monit Tech—Dec. 30, 1908. No. 2649 D.

Mississippi River.

Improvement of the Upper Mississippi River. C. McD. Townsend. The stretch of river from St. Paul to Prescott is described to show the method adopted, and such other parts as illustrate some variation from the general method. Ills. Discussion. 18000 w. Jour W Soc of Engrs—Feb., 1909. No. 3298 D.

Missouri River.

The Missouri River and Its Bridges. J. Y. Oleson. Describes the characteristics of this river, and gives diagrams and dimensions of the 31 bridges crossing it. 1200 w. Eng News—April 29, 1909. No. 4358.

New York.

The Water-Front of New York City. J. A. Benschel. Discusses the reasons for the municipalizing of the water-front and its development. 3500 w. Sch of Mines Qr—July, 1909. No. 7893 D.

See also Liverpool, under WATERWAYS AND HARBORS.

Niagara River.

Hydraulic Measurements in the American Channel at Niagara Falls. Otta S. Zerner. Deals with a study in the American channel of the conditions arising from water diversions above the Falls. Ills. 3500 w. Mich Tech—Feb., 1909. No. 4073 D.

Review of the Report of William Spencer on the Physics of the Niagara River. Isham Randolph. A critical review with suggestions. 5800 w. Can Engr—May 21, 1909. No. 4917.

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Ohio River

WATERWAYS AND HARBORS

Panama Canal

Ohio River.

The Proposed Reservoir System in the Ohio River Basin. M. O. Leighton. A reply to an article by Major H. C. Newcomer. 7000 w. Eng News—Nov. 5, 1908. No. 103.

The Improvement of the Ohio River. William L. Sibert. A review of the various engineering projects proposed for the improvement of this river. Ills. 13000 w. Pro Am Soc of Civ Engrs—Oct., 1908. No. 490 E.

Silt in the Proposed Reservoirs of the Ohio Basin. Herman Stabler. Gives estimates of the sediment accumulation and discusses its effect. 3500 w. Eng News—Dec. 10, 1908. No. 943.

The Permanent Improvement of the Ohio River. P. S. Bond. An account of the project undertaken by the United States Government, including a system of locks and movable dams designed to maintain a least depth of 9 feet. 5500 w. Eng Rec—Dec. 25, 1908. Serial. 1st part. No. 1244.

See also Dams, under WATER SUPPLY.

Panama Canal.

Extracts from the Annual Report of the Isthmian Canal Commission. Report of progress of work for year ending June 30, 1908. Ills. 6000 w. Eng News—Dec. 3, 1908. No. 772.

The Panama Canal. James P. Stabler. A review of the various projects for building a ship canal across the Isthmus and some features of the present work. 3000 w. Mfrs Rec—April 8, 1909. No. 3822.

The Situation at Panama. Forbes Lindsay. A review of the plan and conditions, sanitation, labor, etc. Ills. 3500 w. Am Rev of Rev—April, 1909. No. 3810 C.

The Commercial Prospects of the Panama Canal. G. A. Ballard. An outline of its commercial prospects leading to the conclusion that it is unlikely to prove a commercial success. 5500 w. Contemporary Rev—Dec., 1908. No. 1297 D.

The Present Condition of Work on the Panama Canal. An illustrated account of the present situation based on the latest report of Col. George W. Goethals, recent issues of the *Canal Record*, and information from other sources. 9500 w. Eng Rec—Dec. 5, 1908. No. 829.

The Isthmian Canal. Lieut.-Col. George W. Goethals. From a paper read before the Mfrs. Assn. of Chicago. Explains changes made in the original project for a lock-canal, describing conditions and the

progress of the work and defending the type adopted. 4000 w. Eng News—March 18, 1909. No. 3245.

The Meaning of the Panama Canal to the South. John Barrett. Discusses the effect on South American trade and the importance of preparing by acquiring reliable information concerning these Latin-American countries. 3000 w. Mfrs Rec—Jan. 7, 1909. (Special No.) No. 1558 C.

Present Conditions in the Panama Canal Zone. A favorable account, with illustrations. 2200 w. Sci Am—Feb. 6, 1909. No. 2284.

A Sea-Level Canal at Panama—A Study of Its Desirability and Feasibility. Henry G. Granger. Advocates a reconsideration of the subject, in the light of new facts, and emphasizes the objections to a lock canal, and presents an outline of a construction that the writer favors. 11500 w. Bul Am Inst of Min Engrs—Jan., 1909. No. 2421 F.

A Sea-Level Canal at Panama—A Study of Its Desirability and Feasibility. Discussion of Henry G. Granger's paper on this subject. 17500 w. Bul Am Inst of Min Engrs—July, 1909. No. 6476 F.

The Report of the Board of Engineers on the Panama Canal Work. Report with president's letter, records of engineers forming the advisory board, and editorial discussion. 12000 w. Eng News—Feb. 25, 1909. No. 2757.

Report of Board of Inspecting Engineers on the Panama Canal. Report and editorial. 6500 w. Eng Rec—Feb. 27, 1909. No. 2854.

Some Further Evidence Respecting the Best Type of Canal for Panama. Presents some of the evidence which supports the lock canal plan. Ills. 3500 w. Eng News—March 4, 1909. No. 2999.

Superiority of Lock to Sea-Level Canal. Gives comparative diagrams showing the physical characteristics of the two types of canal, the quantities, costs, etc. 1600 w. Sci Am—March 27, 1909. No. 3521.

The Panama Canal. Editorial on the agitation in regard to the lock-type of canal. 1800 w. Engng—March 19, 1909. No. 3621 A.

The Type of the Panama Canal. C. E. Grunsky. An illustrated review of the proceedings that led to the selection of the lock-type. 9000 w. Pop Sci M—May, 1909. No. 4405 C.

The Foundations for the Gatun Locks. Review of a report by Major Chester Harding, giving information based on re-

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Panama Canal

cent investigations, concerning materials, conditions, etc. Ills. 2000 w. Eng Rec—Jan. 2, 1909. No. 1420.

Analysis Showing that the Panama Canal is Certain to Cost at Least \$210,000,000, or 50 Per Cent. More Than Originally Estimated. Editorial. 2500 w. Engng-Con—Dec. 2, 1908. No. 802.

The Panama Canal Work. Cassius E. Gillette. A defense of the day labor method of building the canal, with editorial reply. 4000 w. Engng-Con—Dec. 30, 1908. No. 1455.

The Panama Canal. J. F. Springer. An illustrated account of the work in progress, the machinery used, and the construction details. 5000 w. 1r Age—July 1, 1909. Serial, 1st part. No. 6060.

The Panama, a Machine Made Canal. Illustrates and describes machines being used, comparing the results with hand labor. 4000 w. Am Mach—Vol 32. No. 28. No. 6325.

Construction of the Obispo Diversion in Connection with the Panama Canal Work. Illustrated description of the work, with topographical map and profile. 3000 w. Eng Rec—June 26, 1909. No. 5996.

The Construction of the Panama Canal (Die Arbeiten am Panama-Kanal). Hermann Bertschinger. A general review of the project and the work already accomplished. Ills. Serial. 1st part. 4000 w. Zeitschr d Ver Deutscher Ing—Jan. 30, 1909. No. 2840 D.

Three Years in the Canal Zone. Dr. Summer Coolidge. An enthusiastic account of what has been accomplished. Also discussion. 7500 w. Jour Assn of Engng Socs—June, 1909. No. 7808 C.

The Panama Canal. Frederic P. Stearns. An account of observations made in a visit to the Isthmus in the early part of 1909. Ills. 6000 w. Jour Assn of Engng Socs—July, 1909. No. 7811 C.

The Present Aspects of the Panama Canal from the Tourist's Point of View. William Tatham. Explains present conditions, and the advantages of the plan adopted. 4500 w. Jour Fr Inst—Sept., 1909. No. 7885 D.

Water Supply for the Lock Canal at Panama. Julio F. Sorzano. A discussion of whether the 40 ft. draft can be maintained at all times in the canal under the conditions which are possible and probable in the locality. 9800 w. Pro Am Soc of Civ Engrs—Oct., 1909. No. 8845 E.

See Also Contractors' Plants, under CONSTRUCTION; Dams, under WATER

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SUPPLY; and Locks and Lock Kates, under WATERWAYS AND HARBORS; and Cranes, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING.

Pará.

The Trade of the Amazon, and the Port of Pará. David F. St. Clair. An illustrated article on the engineering and commercial opportunities in South America. 2500 w. Engineering Magazine—Oct., 1909. No. 8170 B.

Piers.

Largest Pier on the Atlantic Coast. Illustrated description of the new pier at Boston, and its equipment. 4000 w. Marine Rev—Oct., 1909. No. 8551.

The New Piers for Transatlantic Steamships, Chelsea Improvement, New York City. Illustrated description of the largest piece of wharfing construction ever undertaken in the port of New York. 5000 w. Eng News—Jan. 14, 1909. Plate. No. 1785.

The Holland America Line Pier, Hoboken, N. J. The pier shed framework and fire wall and typical details of the structure are described and illustrated. 2500 w. Eng Rec—Oct. 16, 1909. No. 8595.

Reinforced-Concrete Piers in Baltimore Harbor. Illustrates and describes the type of construction used. 1000 w. Eng News—Oct. 1, 1908. No. 212.

New Municipal Piers in Baltimore Harbor. Illustrated detailed description of six large piers with wide slips, especially dealing with piers 4, 5, and 6, of steel and concrete construction. 3500 w. Eng Rec—May 8, 1909. No. 4571.

New San Francisco Shipping Piers, with Concrete Cylinder Foundations and Fireproof Deck and Superstructure. John G. Little. Illustrated description. 2000 w. Eng News—July 8, 1909. No. 6229.

Cost of Small Concrete Piers. J. H. Ryckman. Describes work in Canada, giving cost. 1000 w. Eng Rec—Jan. 23, 1909. No. 2029.

The Construction and Consolidation of Piers at Port de la Pointe des Galets (Etude sur la Construction et la Consolidation des Jetées du Port de la Pointe des Galets). Gaston Bidel. Illustrated description of important work in the harbor of Reunion Island. 14000 w. Ann d Ponts et Chaussées—1909-II. No. 5715 E + F.

Piling.

See same title, under CONSTRUCTION.

CIVIL ENGINEERING

Pollution

Pollution.

The Massachusetts State Board of Health on Pollution of Boston Harbor from the Moon Island Outlet of the Boston Sewerage System. A recent report on this subject. 1000 w. Eng News—Dec. 31, 1908. No. 1409.

The Present Problem as to the Pollution of Lake Michigan. Editorial on the present condition and the proper remedy. 1600 w. Eng News—July 15, 1909. No. 6386.

See also Harbor Pollution, under WATERWAYS AND HARBORS; and Sewage Disposal, under MUNICIPAL.

Portland, Ore.

The Harbor of Portland, Oregon. H. Cole Estep. First of a series of articles illustrating and describing the harbors of Portland, Seattle, Tacoma, Vancouver and Victoria. 3000 w. Marine Rev—May, 1909. No. 4681.

Rangoon.

New Port Works at Rangoon. Illustrates and describes extensive improvements in progress, and special features in the design of the dredger pipe line. 2000 w. Engr, Lond—July 16, 1909. Serial, 1st part. No. 6691 A.

Review of 1908.

Harbors and Waterways, 1908. A review of progress during the past year. 3500 w. Engr, Lond—Jan. 1, 1908. No. 1711 A.

Rhone.

The Navigability of the Rhone (La Navigabilité du Rhone). Pierre Clerget. A discussion of geographical conditions, regulation problems and economic considerations. 5800 w. Rev. Gen des Sci—June 30, 1909. No. 6530 D.

River Beds.

The Form of the Beds of Rivers with Shifting Bottoms (La Forma dell'Alves dei Fiumi a Fondo mobile). G. Crugnola. A discussion of M. L. Fargue's book on the subject. 3500 w. Monit Tech—March 10, 1909. No. 4244 D.

River Improvement.

Report of the Waterways Commissioner of Wisconsin. Gives a portion of this report, by Hon. Ray S. Reid, which presents new views concerning the improvement of navigable rivers. Also editorial. 8000 w. Eng News—Jan. 28, 1909. No. 2149.

The Progress of River Improvements in the Vicinity of Pittsburg. J. W. Arras. An illustrated account of work in the

WATERWAYS AND HARBORS

River Regulation

Allegheny, Monongahela and Ohio rivers for the improvement of navigation. 3500 w. Marine Rev—Feb. 4, 1909. Serial. 1st part. No. 2314.

The Improvement of the Southwest Pass at the Mouth of the Mississippi River. Illustrated description of the jetties built to increase the navigable depth. 3500 w. Eng Rec—April 3, 1909. No. 3713.

See also Kanawha River, under WATER SUPPLY; and Detroit River, under WATERWAYS AND HARBORS.

River Pollution.

River Pollution: Its Ethics, Aesthetics and Hygiene. A discussion at the Royal Sanitary Institute, opened by Mr. Scott-Moncrieff. 6000 w. Surveyor—April 16, 1909. No. 4198 A.

River Regulation.

Forests and Reservoirs in Their Relation to Stream Flow with Particular Reference to Navigable Rivers. Discussion of the paper by H. M. Chittenden. 7500 w. Pro Am Soc of Civ Engrs—Nov., 1908. No. 650 E.

The Report of the Pennsylvania Water Supply Commission: Forests, Stream Flow, and Flood Control. Reviews points of special interest in the report relating to the three subjects referred to above. 1800 w. Eng News—Nov. 19, 1908. No. 377.

River Control by Wire Net-Work. Francis Philip Anderson. Explains conditions on the Bengal Doars railway, describing this wire network device and its uses in the endeavor to control the streams bridged. Ills. 4000 w. Inst of Civ Engrs—No. 3748. No. 2792 N.

River Regulation in Bohemia (Landeskommission für Flussregulierungen im Königreiche Böhmen). Hugo Franz. Reviews the work of the Government Commission during 1906 and 1907. Ills. Serial. 1st part. 5000 w. Oest Wochenschr f d Oeffent Baudienst—Jan. 30, 1909. No. 2818 D.

The Hydrological Importance of Forests (Die hydrologische Bedeutung des Waldes). Discusses forests in their relation to the control and conservation of surface waters. 3300 w. Oest Wochenschr f d Oeffent Baudienst—Feb. 27, 1909. No. 3551 D.

The Regulation of the Lech in Austrian Territory (Die Lechregulierung auf österreichischem Gebiete). Herr Krapf. A brief description of the works projected. Plate 2500 w. Oest Wochenschr f d Oeffent Baudienst—May 22, 1909. No. 5793 D.

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Rock Removal

Eleventh International Congress of Navigation, St. Petersburg, 1908 (XI^e Congrès International de Navigation tenu à Saint-Petersbourg en 1908). G. de Joly and R. de la Brosse. General report of proceedings and a detailed report of the discussion on barrages for river regulation. 20000 w. Ann d Ponts et Chaussées—1909-III. No. 7215 E + F.

See also Ohio River, under WATERWAYS AND HARBORS.

Rock Removal.

A New Sub-Aqueous Rock-Breaking Machine with Chisel Acting in Air Chamber. Barton H. Coffey. Illustrated description of the machine, and report of work in Boston Harbor. 1500 w. Eng News—Feb. 4, 1909. No. 2274.

The Removal of Submarine Rock. Harold Berridge. Deals with the survey, disintegration and removal of débris. 6500 w. Inst of Civ Engrs. No. 3767. No. 3207 N.

Removal of Submarine Rock at the Entrance to Port Phillip, Victoria. Charles William Maclean. Describes work to provide adequate depth of water for deep-draught vessels entering or leaving the Port of Melbourne. (Abstract) Ills. Inst of Civ Engrs—No. 3545. No. 887 N.

See also Dredging, under WATERWAYS AND HARBORS.

Ruhrort.

The Duisburg-Ruhrort Harbor (Vom Ausbau des Hafens zu Duisberg-Ruhrort). Describes various parts of the works. Ills. Serial, 1st part. 2000 w. Deutsche Bau—June 19, 1909. No. 6577 B.

St. Lawrence.

Improvements in the Navigation of the St. Lawrence. William P. Anderson. Read at Winnipeg meeting of the British Assn. Describes details of work to fit the river for the requirements of modern shipping. 3500 w. Engng—Sept. 17, 1909. No. 8129 A.

Saint Nazaire.

The New Approach and New Harbor Works at the Port of Saint Nazaire (La nouvelle Entrée et les Travaux de Transformation du Port de Saint-Nazaire). M. Mallat. Describes recently completed works begun in 1896 to make this harbor on the west coast of France capable of accommodating the largest merchant and naval vessels. Ills. 2500 w. Ann d Ponts et Chaussées—1908, III. No. 501 E + F.

San Francisco.

A Great Pacific Harbor. History of the harbor of San Francisco, with notes

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on the new works. 1700 w. Pub Works—Jan-March, 1909. No. 5647 D.

See also Piers, under WATERWAYS AND HARBORS.

Seattle.

The Harbor at Seattle, Washington. H. Cole Estep. The second of a series of articles describing the principal harbors of the Pacific coast. Ills. 4000 w. Marine Rev—July, 1909. No. 6323.

See also Docks, under WATERWAYS AND HARBORS.

Sea Walls.

Sea Walls and Breakwaters. James Hill Forman. Deals principally with conditions in Great Britain. 4500 w. Inst of Civ Engrs (student's paper No. 607)—Dec. 23, 1907. No. 6452 N.

Saved by Its Wonderful Concrete Sea Wall. Albert Phenix. An account of the way the Galveston sea wall endured a recent severe storm. 3000 w. Mfrs Rec—July 29, 1909. No. 6755.

Construction of a Sea Wall at Fort Morgan, Alabama. Illustrated description of the new concrete wall protecting the entrance to Mobile Bay. 2500 w. Eng Rec—April 24, 1909. No. 4170.

Building a Sea Wall on a Sloping Rock Bottom. Illustrated description of bulkhead wall work on the East River at New York. 4500 w. Eng Rec—April 10, 1909. No. 3858.

Shore Protection.

River Improvement: The Continuous Woven Mattress Revetment Compared to the David Neale System. A critical letter concerning an article by Charles H. Miller, with reply by Mr. Miller. 5000 w. Eng News—Dec. 10, 1908. No. 942.

Caving Banks. B. M. Harrod. Explains the causes of caving and methods of bank protection. 2000 w. Jour Assn of Engng Soc's—Jan., 1909. No. 3225 C.

Method and Cost of Constructing Flexible Revetment for River Bank Protection. Description and cost of a type of revetment used in California. 1400 w. Engng-Con—March 24, 1909. No. 3514.

Recent Revetment Construction on the Lower Mississippi River. Clarke S. Smith. Illustration and brief description of the mat construction at Panther Forest, Ark., recently completed. 1000 w. Eng News—Aug. 26, 1909. No. 7355.

River Protection Work on the Kansas City Southern Railway, Near Braden, Okla. J. A. Lahmer. Describes the conditions, the temporary protection used, and the construction of the more durable

CIVIL ENGINEERING

Stream Gauging

protection by dikes. Ills. 2500 w. Pro Am Soc of Civ Engrs—Oct., 1909. No. 8844 E.

See also Dikes, under WATERWAYS AND HARBORS.

Stream Gauging.

See same title, under MEASUREMENT.

Suez Canal.

The Present Condition of the Suez Canal. Refers to improvements made in the canal since its opening in 1869, and gives a brief description of the present condition. 1500 w. Engr, Lond—April 30, 1909. No. 4628 A.

Sydney, Australia.

Sydney Harbor, New South Wales. Information from the report of the Sydney Harbor Trust commission, with description of the general characteristics of the port. 2000 w. Engr, Lond—June 11, 1909. No. 5635 A.

Tennessee River.

The Improvement of Our Waterways; With Special Reference to the Tennessee River. James Nisbet Hazlehurst. An account of the futility of work costing over seven and a half millions. 3000 w. Eng News—May 6, 1909. No. 4522.

Toronto.

Toronto Harbor. W. J. Fuller. Reviews some of the engineering problems which have arisen from time to time in regard to the harbor and the improvements undertaken. 8500 w. Can Engr—Jan. 29, 1909. No. 2168.

See also Lake Ontario, under WATERWAYS AND HARBORS.

Turkey.

The Sea Ports of Turkey (Les Ports maritimes de la Turquie). Louis Godard. A review of the existing and projected harbors. Ills. 5300 w. Genie Civil—Sept. 4, 1909. No. 8628 D.

U. S. Waterways.

The Waterways of the United States: Actual Expenditures and Results to Navigation and Commerce. Alexander H. Weber. Aims to show the actual facts in the case as derived from a careful analysis of the records. Also editorial. 5000 w. Eng News—May 6, 1909. No. 4520.

Value of Inland Waterways from a Naval Standpoint. George W. Melville. Read before the Inland Waterways Conference. 2000 w. Naut Gaz—Jan. 14, 1909. No. 1757.

Duty of Congress as to National Waterways. Albert H. Scherzer. Urging the

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development of transportation by water in the United States. 2800 w. Mfrs Rec—Feb. 25, 1909. No. 2743.

The Eastern Link in the Great Atlantic Coast Inland Waterway. James C. Sanford. Read at Inland Waterways Conference. A brief description of the engineering features on the proposed canal to connect Narragansett Bay and Boston Harbor. 2500 w. Naut Gaz—Feb. 4, 1909. Serial. 1st part. No. 2286.

The Report Upon the Proposed 14-ft. Deep Waterway from Chicago to New Orleans. Reports of the Board appointed by the U. S. Congress, and the General Board of Engineers on Rivers and Harbors, and comment by General Marshall. Also editorial. 15000 w. Eng News—June 24, 1909. No. 5866.

The Fourteen-Foot Channel from St. Louis to the Gulf. A full abstract of the report of the Mississippi River improvement board. Information on the cost and usefulness of a deep waterway from Chicago to the Gulf of Mexico, adverse to the project. 3500 w. Eng Rec—June 26, 1909. Serial, 1st part. No. 6003.

The Atlantic Coast Waterway. William J. Roe. Maps and discussion of the projected deep water route along the Atlantic coast from Boston to Florida. 3500 w. Naut Gaz—Aug. 26, 1909. Serial, 1st part. No. 7396.

General Conditions of Transportation by Water in the United States. Extract from the report of the U. S. Commissioner of Corporations. Deals mainly with domestic traffic. 5000 w. Eng News—Sept. 9, 1909. No. 7629.

Vancouver.

See Victoria, B. C., under WATERWAYS AND HARBORS.

Victoria, B. C.

The Harbor of Victoria and Vancouver, British Columbia. H. Cole Estep. Illustrated description of the harbors and schemes for their improvement. 4000 w. Marine Rev—Oct., 1909. No. 8548.

Water Hyacinth.

The Water Hyacinth Problem. John Klorer. An account of its introduction into the United States in 1884, and the necessity of checking its growth or removing it from streams, with some of the methods. Ills. 2500 w. Jour Assn of Engng Socs. Jan., 1909. No. 3226 C.

Water Powers.

The Use and Conservation of Water Power Resources. H. von Schon. This third and closing article of a series

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Water Powers

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Water Powers

analyzes typical cases and suggests programmes for their development. 4000 w. Engineering Magazine—Dec., 1908. No. 674 B.

Relation of the Federal Government to Undeveloped Water Power on Navigable Streams. J. E. Serrine. Discusses especially the development of water power in the south, and the proper restrictions to be placed on such enterprises. 2500 w. Eng Rec—Aug. 21, 1909. No. 7303.

The Administration's Position Regarding Water Power Development. A message to the House of Representatives, by President Roosevelt. 3000 w. Eng Rec—Jan. 23, 1909. No. 2021.

State Control of Water Power. Curtis E. Lakeman. Presents reasons for the adoption of public policies of water conservation. 4500 w. Am Rev of Revs—Jan., 1909. No. 1736 C.

The Valuation of Water Power and the Estimation of Stream Diversion Damages. Robert E. Horton. Discusses various phases of this subject, giving opinions based on water power litigations. 9500 w. Am W-Wks Assn—June, 1909. No. 5903 N.

Water-Power from Streams of Moderate Fall. Sylvester Stewart. An illustrated discussion of the utilization of hydraulic power resources. 1500 w. Casier's Mag—Sept., 1909. No. 7781 B.

To Determine the Value of Water Power. W. T. Ryan. Explains simple methods of making an estimate of the available power. 1500 w. Power—Oct. 12, 1909. No. 8516.

Potentiality of Water-Power. Resources of the South. H. von Schon. Information concerning the available power and the explanation of the retarded development. 4000 w. Mfrs Rec—Jan. 7, 1909. (Special No.) No. 1556 C.

The Value of Southern Water-Power Investments. Francis R. Weller. Points for the guidance of those interested in their development. 3000 w. Mfrs Rec—Jan. 7, 1909. (Special No.) No. 1557 C.

Water Power Development in the Pacific Northwest. Louis P. Zimmermann. Information regarding the immense water power available and as yet largely undeveloped, especially in Washington. 2500 w. Minn Engr—Jan., 1909. No. 2731 C.

The Control of Hydraulic Power Development in New York. Abstract of the recent report of the State Water Supply Commission, with editorial. 7000 w. Eng Rec—Feb. 13, 1909. No. 2452.

Connecticut River for Electric Power. Alton D. Adams. Discusses the power that

may be developed for purpose of electric transmission. 2000 w. Elec Rev, N Y—Feb. 13, 1909. No. 2462.

Water Power Possibilities, at Muscle Shoals, on Tennessee River. S. Mays Ball. Map and description of power being developed. 1500 w. Elec World—Dec. 26, 1908. No. 1287.

The Susquehanna River as a Source of Power. Mason D. Pratt. Read before the Engrs' Club of Central Penn. A study of data and hydrographs with the view of showing some of the limitations of this river. 4500 w. Eng News—June 10, 1909. No. 5461.

Review of the Water-Powers of South Carolina—Developed and Undeveloped. S. Mays Ball. A study of the river systems and the known water powers. 3500 w. Elec Rev, N Y—May 8, 1909. No. 4583.

A Review of the Water-Powers of Alabama, Chiefly Undeveloped. S. Mays Ball. A statement based on reports made by the U. S. Geol. Survey and the Geol. Survey of Alabama. 4500 w. Elec Rev, N Y—March 20, 1909. No. 3266.

The Conservation of the Forests and Water Powers of Wisconsin. E. M. Griffith. An account of the work in progress and in prospect and its objects. Ills. Discussion. 6000 w. Jour W Soc of Engrs—Oct., 1908. No. 356 D.

Wisconsin's Water Power Resources. L. S. Smith. An illustrated article, giving an outline of the undeveloped water powers. 1600 w. Wis Engr—June, 1909. No. 5694 D.

The Utilization of the Water Powers of Germany (Deutschlands Wasserkräfte und ihre technische Auswertung). Richard Hennig. A discussion of the power resources, their economic importance, and the principles on which they should be utilized. Serial. 1st part. 3000 w. Die Turbine—Feb. 20, 1909. No. 3377 D.

Government Control of Water-Power Utilization in Switzerland (Schweizerische Bundesgesetzgebung über Ausnutzung der Wasserkräfte). Dr. E. Frey. An outline and discussion of the regulations. Serial. 2 parts. 3700 w. Schweiz Bau—April 17 and 24, 1909. No. 4876, each B.

The Water Powers of Sweden, Norway and Switzerland (Die Wasserkräfte Schwedens, Norwegens und der Schweiz). Eduard Engelmann. Brief descriptive notes on the leading water powers of these three countries. Ills. Serial. 1st part. 5500 w. Zeitschr f d Gesamte Turbinenwesen—Dec. 10, 1908. No. 1957 D.

The Water Powers of Sweden, Norway and Switzerland (Die Wasserkräfte

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Weirs

Schwedens, Norwegens und der Schweiz). Eduard Engelmann. Gives detailed information of the hydraulic power available in these three countries and of present developments. Ills. Serial. 1st part. 4700 w. *Zeitschr d Oest Ing u Arch Ver*—Oct 16, 1908. No. 581 D.

The White Coal of Sweden. John George Leigh. An illustrated study of the development of the abundant hydraulic power of Scandinavia. 7000 w. *Cassier's Mag*—Feb., 1909. No. 2326 B.

Westland's Water Power Resources. Percy Gates Morgan. Illustrated account of the important sources of water power in this part of New Zealand, with an account of the h. p. available. 2500 w. *N Z Mines Rec*—April 16, 1909. No. 5821 B.

See also Isolated Plants, under ELECTRICAL ENGINEERING, GENERATING STATIONS; and Finland, under RAILWAY ENGINEERING, MISCELLANY.

Weirs.

An Investigation of the Coefficients of Discharge of Thin-Edged Weirs with Full End Contractions Discharging Water Under Low Heads. Hans von Vittinghoff,

MISCELLANY

Dangerous Structures

Victor von Starzenski, and W. Roland Wiley. Descriptive. Ills. 3000 w. *Stevens Ind*—Jan., 1909. No. 3812 D.

Wharves.

The Construction of a Quay Wall in Open Water by Divers. Notes from a paper by John Taylor, before the Can. Soc. of Civil Engrs., describing his work at Portland Harbor. 2500 w. *Eng Rec*—May 28, 1909. No. 5150.

The Construction of a Concrete Mass and Block-Work Quay Wall by Helmet Divers in Open Water. John Taylor. Describes a wall built at Portland Harbor, England. Ills. 5000 w. *Can Soc of Civ Engrs*—April 29, 1909. No. 4553 N.

The Reinforced Concrete Wharf of the United Fruit Company at Bocas del Toro, Panama. T. Howard Barnes. Illustrated detailed description of the construction of a wharf in waters where the *Terodo navalis* is troublesome. 5700 w. *Pro Am Soc of Civ Engrs*—Sept., 1909. No. 8184 E.

The Paris-Austerlitz Wharf and Public Sheds (Port et Magasins publics de Paris-Austerlitz). Ch. Dantin. Illustrated description of a covered wharf on the Seine at Paris. 5000 w. *Génie Civil*—June 26, 1909. No. 6549 D.

MISCELLANY

Aesthetics.

The Aesthetic Treatment of Engineering Construction (*Die ästhetische Ausbildung der Ingenieurbauten*). Hermann Muthesius. A plea for more regard to aesthetic effect in all sorts of structures. 7000 w. *Zeitschr d Ver Deutscher Ing*—July 31, 1909. No. 7479 D.

Architecture.

Influence on Architecture of Modern Construction. Henry H. Hill. Awarded Silver Medal of the Roy. Inst. of British Archts. An investigation of methods directly influencing architectural expression. 4500 w. *Eng Rec*—Oct. 23, 1909. No. 8708.

Army Engineers.

Engineers and the Territorials. Discusses the engineer services of the British Territorial Army. 3000 w. *Engr, Lond*—May 21, 1909. No. 5197 A.

Australia.

Engineering in Australia; Pioneering a Continent. Jas. Alex. Smith. Pres. address before the Victorian Inst. of Engrs. A critical discussion of the engineering administration. 2500 w. *Aust Min Stand*—March 17, 1909. Serial, 1st part. No. 4188 B.

Building Removal.

Note on the Work of Raising and Moving the Antwerp-Dam Station Building.

Albert Morglia. Illustrated detailed description. 5800 w. *Bul Int Ry Cong*—Oct., 1908. No. 167 G.

Raising and Moving the Antwerp Station (Notes sur le Rehaussement et le Déplacement de la Station: Anvers-Dam). P. Deprez. Illustrated description of the work. 3000 w. *All Indus*—Oct., 1908. No. 526 D.

Caisson Disease.

Caisson Disease and Its Prevention. Henry Japp. An account of methods tried during the building of the East River tunnels at New York City. Ills. 6000 w. *Pro Am Soc of Civ Engrs*—April, 1909. No. 4336 E.

Caisson Disease and Its Prevention. The paper by Henry Japp is discussed. 4000 w. *Pro Am Soc of Civ Engrs*—Aug., 1909. No. 7369 E.

Contracts.

Loose Specifications and Dishonest Contracts. Editorial criticism of the framing of certain contracts. 1200 w. *Eng News*—Oct. 1, 1908. No. 213.

Dangerous Structures.

Dangerous Structures. E. Willis. Remarks on where the responsibility for such structures rests in England, giving examples and methods of dealing with them. Ills. 4000 w. *Surveyor*—July 23, 1909. No. 6844 A.

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Drawings

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Tropics

Drawings.

Copyright in Drawings of a Technical Character. D. A. Usina. Brief discussion of the new law to go in effect July 1, 1909, in the United States. 1500 w. Pro Am Soc of Civ Engrs—May, 1909. No. 5106 E.

Earthquakes.

Earthquake Forecasts. G. K. Gilbert. Abstract of address to the Am. Assn. of Geog. Discusses the possibility of scientific forecast, and the duty of architects and engineers to study the danger factor in connection with construction in earthquake regions. 3500 w. Min & Sci Pr—Jan. 30, 1909. No. 2290.

Earthquakes in the Light of the New Seismology. Oscar C. S. Carter. Outlines the theories advanced concerning the conditions of the earth below the surface, studies the causes of earthquakes, illustrating and describing seismographs and their use. 11500 w. Jour Fr Inst—June, 1909. No. 5806 D.

See also same title, under BRIDGES and CONSTRUCTION.

Engineers' Fees.

Tariff of Compensation for Engineering and Architectural Work (Tariffa di Competenze per Lavori di Ingegneria e Architettura). Gives a schedule of the fees established by the Italian Society of Engineers and Architects. 2100 w. Ann d Soc d Ing e d Arch Ital—Aug. 1, 1909. No. 7941 F.

Forestry.

Forestry Operations About the Wachusett Reservoir. Notes from a paper by E. R. B. Allardice, describing the methods followed in maintaining the wood lots and planting the unforested portion of the reservation. 1700 w. Eng Rec—May 15, 1909. No. 4692.

Some Problems of Forestry. Leslie B. Seely. Considers the economic side of the problem, showing results achieved in European countries; discusses the influence of forests on precipitation and drainage. 6000 w. Jour Fr Inst—July, 1909. No. 6352 D.

Geology.

The Principles of Engineering Geology. Herbert Lapworth. Lectures to students demonstrating the close relationship of civil engineering and geology. Ills. 10500 w. Inst of Civ Engrs. No. 2799 N.

Graphical Computation.

Graphical Computation. E. P. Goodrich. Describes its successful application to the special case of compiling a table of strengths of concrete slabs. 1200 w. Eng Rec—Aug. 21, 1909. No. 7301.

History

The Engineer's Work in the West, at an Early Day and During the Civil War. Gen. Grenville M. Dodge. A review of the writer's experience previous to and during the Civil War, and in building the Union Pacific. 7000 w. Jour W Soc of Engrs—Feb., 1909. No. 3296 D.

Ice.

Hauling a Contractor's Plant Across the Ice on the Hudson River. Describes methods used in taking the larger part of a plant on the N. Y. State barge canal across the Hudson, giving the bearing power of ice ten inches thick. 1000 w. Eng News—May 20, 1909. No. 4783.

Landslides.

The Salette Landslide of 1908 and Some Earlier Quebec Landslides. Describes five slides in Quebec, and also slides in British Columbia. 3500 w. Eng News—May 27, 1909. No. 5021.

Nicaragua.

Labor Conditions on the Atlantic Coast of Nicaragua. H. D. Mendenhall. Discusses the difficulties involved with labor in engineering work in Central America and methods of dealing with laborers. 3500 w. Eng Rec—June 5, 1908. No. 5278.

Photography.

Engineering Photography. William Munson Christie. Discusses progress in photography in general and features of engineering photography. Ills. 2500 w. Eng Rec—April 3, 1909. No. 3717.

Review of 1908.

Engineering in the United States in 1908. A general review, the present number deals with railways and bridges. 6000 w. Engr, Lond—Jan. 15, 1909. Serial. 1st part. No. 2080 A.

Soil Erosion.

Opinions of Foreign Engineers on the Value of Forests for Preventing Erosion. Extract from a paper on "Conservation," by George F. Swain, before the Nat. Assn. of Cotton Mfrs. Gives extracts from reports from different countries. 1800 w. Eng News—May 6, 1909. No. 4524.

Strain Models.

Models for Illustrating the Strain on Structures. Dr. Alfred Gradenwitz. Illustrated description of models used by F. Carlipp, of Erlangen, Germany. 1800 w. Sci Am—Dec. 26, 1908. No. 1291.

Tropics.

Suggestions for the Conduct of Engineering Work in the Tropics. Robert Burgess. Discusses the various phases of the labor problem and the methods and equipment. 6000 w. Eng News—March 11, 1909. No. 3101.

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Bells

Bells.

Fitting Electric Bells. Clarence Biggs. Hints for amateur electricians. Ills. 3000 w. Sci Am Sup—Sept. 18, 1909. No. 7805.

Cables.

See Submarine Cables, and Telephone Cables, under COMMUNICATION.

Radio-Telegraphy.

Post-Graduate Lectures on Radio-telegraphy and Radiotelephony. Prof. J. A. Fleming. Abstract of lectures being given at the University College, London. 1500 w. Engng—Oct. 30, 1908. Serial, 1st part. No. 191 A.

Post-Graduate Lectures on Radiotelegraphy and Radiotelephony. Prof. J. A. Fleming. Brief review of Prof. Fleming's fifth and sixth lectures delivered at University College. 2000 w. Engng—Dec. 4, 1908. No. 1020 A.

Post-Graduate Lectures on Radiotelegraphy and Radiotelephony. J. A. Fleming. Reviews the seventh and eighth lectures on the above subject. 2200 w. Engng—Dec. 18, 1908. No. 1373 A.

Researches in Radiotelegraphy. Prof. J. A. Fleming. Lecture before the Roy Inst. Gives a summary of results of recent research work. 2000 w. Elect'n, Lond—June 11, 1909. Serial. 1st part. No. 5653 A.

The Function of the Earth in Radio-telegraphy. J. A. Fleming. Refers freely to the paper by Dr. J. Zenneck, on "The Propagation of Plane Electromagnetic Waves Over a Plane Conducting Surface with Reference to Wireless Telegraphy," with added explanations. 1500 w. Engng—June 4, 1909. Serial. 1st part. No. 5531 A.

Transatlantic Wireless Telegraphy. G. Marconi. From a discourse delivered at the Royal Inst. Describes results and ob-

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servations recorded during a series of tests made to prove that wireless telegraphy across the Atlantic was possible as a means of commercial communication. Ills. 4000 w. Nature—April 22, 1909. Serial, 1st part. No. 4441 A.

The Wireless Telegraph. W. B. Kouwenhoven. A brief explanation of electric waves and a description of the apparatus for their propagation. 3000 w. Ry & Loc Engng—June, 1909. No. 5236 C.

Recent Patents in Wireless Telegraphy and Telephony. W. H. Eccles. Considers recent patent specifications that deal with apparatus of importance or interest. Diagrams. 2000 w. Elect'n, London—Nov. 6, 1908. Serial, 1st part. No. 311 A.

Recent Patents in Wireless Telegraphy and Telephony. W. H. Eccles. An illustrated review of the past year. 2000 w. Elect'n, Lond—Oct. 15, 1909. Serial. 1st part. No. 8869 A.

Wireless Telegraphy in the U. S. Navy. Information in regard to the equipments of the navy vessels. Ills. 1200 w. Elec Wld—Sept. 30, 1909. No. 8247.

Wireless Telegraphy in the American Republics. An illustrated review of progress. 3000 w. Bul Am Reps—April, 1909. No. 3930 N.

The Actual State of Wireless Telegraphy (L'Etat Actuel de la Télégraphie sans Fil). The first part discusses the general theory and principles. Ills. Serial, 1st part. 2500 w. Génie Civil—Oct. 17, 1908. No. 535 D.

Wireless Telegraphy (La Telegrafia inalámbrica). E. Guarini. A discussion of its past, present and future and application in countries like Peru. Ills. Serial, 1st part. 3000 w. Anales d l Soc Cien Argentina—Aug., 1908. No. 2655 E + F.

Wireless Telegraphy (La Télégraphie sans Fil). M. Ferrié. A review of the

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theory and present state of wireless communication. Ills. 4800 w. Ann d Ponts et de Chaussées—1909-I. No. 4810 E + F.

Fundamental Principles in the Design of Spark-Telegraphy Stations. Dr. F. Kiebitz. Abstract from *Elektrotechnische Zeit*. Reviews the developments that have led to the improved results. 1000 w. Elect'n, Lond—April 30, 1909. No. 4604 A.

Radio-Telegraphy (Radiotelegrafie). A. E. R. Collette. A general review of modern achievements and developments. Ills. 10000 w. Ingenieur—Aug. 7, 1909. No. 8157 D.

Recent Progress in Wireless Telegraphy and Telephony (Les Progres récente de la Télégraphie et de la Téléphonie sans Fil). H. Marchand. A review of recent inventions. Ills. 7500 w. Rev Gen des Sci—Sept. 15, 1909. No. 8610 D.

A Note on the Production of Steady Electric Oscillations in Closed Circuits and a Method of Testing Radio-Telegraphic Receivers. J. A. Fleming and G. B. Dyke. Abstract of paper before the Phys. Soc. Describes apparatus at University College, London, and tests on various detectors. 1500 w. Elect'n, Lond—May 21, 1909. No. 5187 A.

The Utilization of the Total Radiation from an Inductively Coupled Antenna in Radiotelegraphy. J. A. Fleming. Briefly considers methods of avoiding energy loss. 700 w. Elect'n, Lond—June 11, 1909. No. 5651 A.

The Theory of Coupled Circuits. Louis Cohen. A mathematical paper developing a method of solving the problems, and yet avoiding the difficulty of getting the roots of a biquadratic equation. These coupled circuits are used to increase the energy for radiation in wireless telegraphy. 4000 w. Bul Bureau of Stand—May, 1909. No. 6371 N.

Antennae. G. W. Pickard. Read before The Wireless Inst. Discusses the antennae in present use. 2000 w. Elect'n, Lond—July 23, 1909. No. 6837 A.

Note on Horizontal Receivers and Transmitters in Wireless Telegraphy. H. M. Macdonald. Read before the Roy. Soc. Considers the theory of such an arrangement. 1200 w. Elect'n, Lond—June 4, 1909. No. 5519 A.

Inductance Coils Used in Wireless Telegraphy. John L. Hogan, Jr. Illustrates and describes different types of construction in variable induction coils and their advantages. 2000 w. Elec Wld—Feb. 18, 1909. No. 2519.

The Cooling of Rotating Discs Considered in Connection with Marconi's New

Generator of Continuous Oscillations Information from a contribution by R. Rüdenberg in the "Jahrbuch, der Drahtlosen Telegraphie." 1500 w. Elect'n, Lond—Dec. 25, 1908. No. 1524 A.

Directed Wireless Telegraphy. F. Kiebitz. Abstract trans. from *Ver. der Deutscher Phys. Gesellschaft*. Describes experiments. 1500 w. Elect'n, Lond—April 3, 1909. No. 3899 A.

Theory of the Horizontal Transmitting Antenna. Alfredo Montel. Abstract from *La Lumière Electrique*. Presents a simple method of treating the problem of this antenna mathematically. 600 w. Elect'n, Lond—Feb. 19, 1909. No. 2878 A.

A Directive System of Wireless Telegraphy. E. Bellini and A. Tosi. Describes the author's bilateral directive wireless telegraph system and gives particulars of a new unilateral directive method. 1500 w. Elect'n, Lond—Jan. 15, 1909. No. 2069 A.

The Bellini-Tosi Directive System of Wireless Telegraphy and Telephony (Télégraphie et Téléphonie sans Fils dirigeables Bellini-Tosi). M. Tosi. Illustrated detailed description. 6000 w. Bul Soc Int des Elecns—Dec., 1908. No. 1906 F.

Bellini-Tosi System. Illustrates and describes a method of directing Hertzian waves. 1200 w. Sci Am Sup—June 12, 1909. No. 5405.

The Artom System of Radiotelegraphy. From a paper by Prof. Alessandro Artom before the Italian Elec. Assn. Brief description of this system. Ills. 800 w. Elec Rev, N Y—Nov. 28, 1908. No. 620.

The Composition of Electromagnetic Fields and Waves (Sulla Composizione dei Campi e delle Onde elettromagnetiche). A. Artom. A discussion of the author's system of wireless telegraphy. Ills. Serial, 1st part. 2000 w. Elettricita—Feb. 11, 1909. No. 3349 D.

A New System of Wireless Telegraphy Used by the Telefunken Company, Count Arco. Explains the practical and technical advantages of this new system. 2500 w. Elec Rev, N Y—May 29, 1909. No. 5166.

The New Telefunken Telegraph. Count Arco. Describes a combination of the arc and spark systems. 3000 w. Sci Am Sup—June 19, 1909. No. 5585.

A New System of Wireless Telegraphy Used by the Telefunken Company, Count Arco. Describes a system which is a compromise between the "spark" and the "arc" systems. 3000 w. Elect'n, Lond—April 30, 1909. No. 4603 A.

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The New Telefunken Method of Wireless Telegraphy. W. H. Eccles. An examination of the merits of recent alterations introduced in this system. 2500 w. Elect'n, Lond—July 30, 1909. No. 6076 A.

The Telefunken or Quenched Spark Discharger. J. A. Fleming. Describes experiments seeming to prove that the operative principles of the Telefunken and von Lepel dischargers are different. 900 w. Elect'n, Lond—June 11, 1909. No. 5650 A.

The Lepel System of Wireless Telegraphy. Illustrates and describes the working parts of the Lepel apparatus. 1000 w. Elect'n, Lond—May 14, 1909. No. 4946 A.

The Lepel Wireless Telegraph System. Baron von Lepel. Aims to show that Count Arco's telefunken system is an intentional copy of the von Lepel system. Also an experimental investigation of the latter system, made by J. Erskine-Murray. 3500 w. Elect'n, Lond—June 18, 1909. No. 6030 A.

Selective Wireless Telegraphy. Oliver Lodge. Description of experiments to test the facility and perfection of tuning in the Lodge-Muirhead system. 1800 w. Nature—May 27, 1909. No. 5268 A.

Acoustics Tuning in Wireless Telegraphy. A brief description of the system of John H. Cuntz, in which electrical tuning is replaced by mechanical and acoustic syntonization. 800 w. Elec Engr, Lond—Oct. 8, 1909. No. 8858 A.

The Perry-Prentice Wireless Signaling System. H. Avery Blair. Illustrated description. 5000 w. Bul Int Ry Cong—Aug., 1909. No. 8031 G.

The Bolt Head Wireless Telegraph Station of the General Post Office. Illustrated description of this recently opened English station for communicating with ships at sea. 2200 w. Elec Engng—Dec. 17, 1908. No. 1390 A.

The Radio-Telegraphic Station at Cultercoats. S. M. Sørensen. Abstract of paper before the Newcastle Sec. of Inst. of Elec. Engrs. Describes the construction and working of a spark system. 2400 w. Elect'n, Lond—June 4, 1909. No. 5516 A.

See also Hertzian Waves, under ELECTRO-PHYSICS.

Radio-Telephony.

A New System of Wireless Telephony. A. Carletti. Illustrated description of experimental work by Prof. Quirius Majorana, and the system that has made possible intercommunication over a distance of

312 miles. 1200 w. Elect'n, Lond—Jan. 29, 1909. No. 2347 A.

The Majorana System of Wireless Telephony. Information concerning the system and some tests made in Italy. Elec Engng—Feb. 25, 1909. No. 3049 A.

The Majorana System of Wireless Telephony. H. J. Reiff. Describes a new system of interest and practical value. Diagrams. 900 w. Elec Engr, Lond—Oct. 8, 1909. No. 8857 A.

Wireless Telephony (Telefonia elettrica senza Fili). O. Majorana. A discussion of the Poulsen system of wireless telephony. Ills. 2500 w. Elettricità—April 15, 1909. No. 4845 D.

Improvements in the De Forest System of Wireless Telephony. Walter Kendall. Illustrates and describes recent developments, especially the installations of the Great Lakes Radio-Telephone Co. 1500 w. Sci Am—June 19, 1909. No. 5582.

Wireless Telephony (Drahtlose Telephonie vermittelt elektrischer Schwingungen). Gustav Eichhorn. A review of the fundamental principles and present developments. Ills. 3000 w. Oest Wochenschr f d Oeffent Baudienst—Jan. 23, 1909. No. 2817 D.

Wireless Telephony (La Téléphonie sans Fil). The first part discusses the general theory. Ills. Serial, 1st part. 2800 w. Génie Civil—March 13, 1909. No. 4235 D.

Wireless Telephony (La Téléphonie sans Fil). C. Tissot. A general review of its history and present state. Ills. 6000 w. Tech Mod—March, 1909. No. 4229 D.

Wireless Telephony (La Téléphonie sans Fil). V. Colin. A review of its discovery, development, and present achievements. Ills. 7700 w. Bul Soc Int des Elecns—July, 1909. No. 7208 F.

The Stability of the Poulsen Arc (Remarque sur la Stabilité de l'Arc de Poulsen). C. Tissot. A discussion based on experiments. Ills. 2500 w. Bul Soc Int des Elecns—July, 1909. No. 7209 F.

See also Radio-Telegraphy, under COMMUNICATION.

Submarine Cables.

Modern Submarine Telegraphy. S. G. Brown. Abstract of a paper before the Roy. Inst. Illustrates and describes the cables now used, the instruments, etc. 3000 w. Elect'n, Lond—July 30, 1909. Serial, 1st part. No. 6978 A.

The New Victoria and Tasmania Telegraph Cables. Description of the first cables laid for the Commonwealth government connecting Flinders Bay, Victoria, and East Bay, Low Head, Tas-

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Telautograph

mania. Ills. 800 w. Elec Engng—May 27, 1908. No. 5415 A.

Injury to Submarine Cables by Steam Trawlers. Report of the Inter-Departmental Committee appointed to inquire into the injury caused by trawlers, and to suggest means of preventing such injury. 3800 w. Elect'n, London—Oct. 23, 1908. No. 74 A.

Telautograph.

A New Form of Tetautograph. Dr. Robert Grimshaw. Illustrated description of Grazanna's apparatus and its action. 800 w. Sci Am—Nov. 21, 1908. No. 332.

The Telautograph in Steel Mills. Illustrates and describes applications. 2000 w. Ir Trd Rev—June 17, 1909. No. 5586.

Telegraph Batteries.

Characteristics of Dry Batteries. F. H. Loveridge. Indicates the classes of service they are best adapted to meet, and precautions that should be taken to insure best results. 3500 w. Elec Engr, Lond—Oct. 8, 1909. No. 8859 A.

Telegraph Cables.

Cable-Fault Localization Graphs in Practice. Edward Raymond-Barker. The first of a series of articles giving results of recent experience and research. 2500 w. Elec Rev, Lond—Oct. 8, 1909. Serial. 1st part. No. 8862 A.

Telegraph Lines.

The Construction of Overhead Lines in France (Construction des Lignes électriques aériennes). Describes in detail the latest practice in transmission and telegraph line construction in France. Ills. Serial, 1st part. 1600 w. L'Electn—Feb. 20, 1909. No. 3332 D.

See also Telephone Lines, under COMMUNICATION.

Telegraph Offices.

The Reconstruction of the Vienna Central Telegraph Office (Der Umbau der Wiener Telegraphenzentrale). J. Jokisch. Detailed description of the new building. Ills. 6500 w. Oest Wochenschr f d Oeffent Baudienst—Oct. 10, 1908. No. 577 D.

Telephonage.

The Telephonage. Charles K. Fankhauser. Explains the principles embodied, its accomplishments, applications and influence. 3500 w. Jour Fr Inst—Jan., 1909. No. 1848 D.

Telegraph Printers.

The Murray Photo-Printing System. Describes a system designed to print in Roman type direct from line, using Wheat-

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stone transmitting apparatus and the Morse alphabet. 2500 w. Elec Rev, Lond—Sept. 24, 1909. Serial. 1st part. No. 8341 A.

Telegraph Wires.

Testing and Care of Wires. V. T. Kissenger. From a paper read before the Ry Telegraph Supts. Assn. General directions. 700 w. R. R. Age Gaz—July 30, 1909. No. 6783.

Telegraphy.

The Kotyra Keyboard Perforator for Wheatstone Automatic Working. Illustrated description of this improved machine and its operation. 1000 w. Elec Rev, Lond—March 19, 1909. No. 3602 A.

Diplex-Duplex Realisable by Means of Ordinary Instruments and Without Balance (Diplex-Duplex réalisable au Moyen des Appareils ordinaires et sans Balance). M. Henry. Illustrated description of method. 3500 w. Soc Belge d'Electn—Oct. 1908. No. 510 E.

The Technical Problems of Telegraphy and Telephony (I Problemi tecnico-scientifici della Telegrafia e della Telefonia). G. di Pirro. A general discussion of electrical methods of communication. Ills. 5500 w. Ann d Soc d Ing e d Arch Ital—Dec. 15, 1908. No. 1935 F.

The C. R. Law and High-Speed Cable Telegraphy (Das C. R. Gesetz und die Kabelschnelltelegraphie). Bela Gati. Mathematical discussion, with large reference to A. E. Kennelly's formulæ. Ills. 3500 w. Elektrotech u Maschinenbau—Sept. 12, 1909. No. 8901 D.

See also Magnetic Storms, under ELECTRO-PHYSICS.

Telemechanic.

Standard Clocks Operated by Wireless. Illustrates and describes a scheme of wireless operation of an extensive standard clock system in Vienna, Austria. 1000 w. Sci Am Sup—Oct. 23, 1909. No. 8588.

Telephone Cables.

The Modern Telephone Cable. Frank B. Jewett. Considers the essential requirements and how nearly the present dry-core cable meets them. 5000 w. Pro Am Inst of Elec Engrs—July, 1909. No. 6495 F.

The Most Economical Combination of Capacity and Inductance in Underground Telephone Cables. B. S. Cohen. A criticism of conclusions reached by M. Devaux-Charbonnel in regard to increased transmission value of low capacity cable. 1500 w. Elect'n, Lond—July 23, 1909. No. 6835 A.

Telephone Cables

The Capacity of Paper Condensers and Telephone Cables. With a Note on the Determination of the Specific Inductive Capacity of Dielectrics. A. Zelenny and A. P. Andrews. Abstracted from *Physical Rev.* 700 w. *Elect'n*, Lond—March 12, 1909. No. 3406 A.

Some Considerations in the Manipulation of Dry-Core Telephone Cables. F. G. C. Baldwin. Abstract of paper before the Birmingham Sec. of the Inst. of Elec. Engrs. Considers telephone practice, describing operations and methods to secure working efficiency. 1800 w. *Elec Engr*, Lond—April 23, 1909. Serial, 1st part. No. 4446 A.

Telephone Cables with Iron Wire Covering (Beitrag zur Berechnung von Fernsprechkabeln mit Eisendrahtumspinnung). Absalon Larsen. A mathematical discussion of the design of cables with increased inductance. Ills. 5000 w. *Elektrotech Zeitschr*—Oct. 22, 1908. No. 614 B.

New Observation on Long Distance Submarine Cables. F. Breisig. Abstract from *Electrotechnische Zeit.* Describes experience with submarine telephone cables in which the copper conductors are wound for their entire length with fine iron wire. 2000 w. *Elect'n*, Lond—Nov. 27, 1908. No. 860 A.

Principles of Fault Location. Julius Bernstein. Abstract of a paper read at the convention of Am. Munic. *Elect'ns*. Remarks confined to testing instruments based upon the principle of the Wheatstone bridge and methods of telephone practice. 3500 w. *Elec Engr*, Lond—Aug. 20, 1909. No. 7433 A.

Location of Faults in Cables. H. Mauradian. Discusses the correction of the Murray loop test, giving formula. Also editorial. 800 w. *Elec Wld*—May 13, 1909. No. 5040.

Telephone Exchanges.

The Automatic Telephone Central. Snowden B. Redfield. Describes new automatic apparatus and its operation. Ills. 4500 w. *Am Mach*—Vol. 32, No. 16. No. 4104.

Telephone Lines.

Prominent Characteristics of Long Distance Telephone Lines. A. B. Domonoske. A brief discussion of the principal physical properties and phenomena of the telephone line. 1600 w. *Cal Jour of Tech*—Oct., 1909. No. 8759.

Telegraph and Telephone Systems as Affected by Alternating-Current Lines. J. B. Taylor. A statement of power trans-

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mission and telegraph and telephone conditions as they exist, with special reference to combinations, which may make trouble if operated simultaneously. Ills. 9500 w. *Pro Am Inst of Elec Engrs*—Oct., 1909. No. 8534 F.

New Types of Pupin Coils for Overhead Lines (Neue Typen der Pupinschen Freileitungsspule). Robert Nowotny. Illustrates and describes the apparatus and its installation. 2700 w. *Elektrotech u Maschinenbau*—Jan. 3, 1909. No. 2826 D.

The Maximum Capacity of Telephone Lines (La Portée maximum des Lignes Téléphoniques). M. Devaux-Charbonnel. A theoretical discussion. Ills. Serial, 1st part. 4000 w. *Tech Mod*—Aug., 1909. No. 7927 D.

See also Telephony, under COMMUNICATION.

Telephone Time Checks.

Telephone Time Checks (Les Compteurs Téléphoniques). M. Henry. Illustrates and describes a number of typical and novel devices. Serial, 1st part. 4400 w. *L'Elec'n*—July 17, 1909. No. 7220 D.

Telephone Tolls.

The Economical Development of Toll Territory. Frank F. Fowle. Considers the principal factors in building up a successful toll plant. 4000 w. *Elec Rev*, N Y—Jan. 9, 1909. Serial, 1st part. No. 1658.

Telephone Transmitters.

Raymond Barker's Multi-Tone Vibrating Transmitter. Illustrated description of a novel instrument exhibited at the Physical Society's Exhibition. 1500 w. *Elect'n*, Lond—Dec. 18, 1908. No. 1394 A.

The Two-Tone Vibrating Transmitter and Inductive Signaling. Edward Raymond-Barker. Discusses its application especially to maintaining communication between ship and shore during cable repair. 4000 w. *Elect'n*, Lond—Jan. 15, 1909. No. 2073 A.

Telephony.

The Development of Telephony. Sergius P. Grace. An illustrated review with discussion. 7400 w. *Pro Engr's Soc of W Penn*—Oct., 1908. No. 348 D.

The Automatic System of Telephony. W. Lee Campbell. An illustrated discussion of the Strowger system. 5500 w. *Jour Fr Inst*—March, 1909. No. 3249 D.

The Influence of Terminal Apparatus on Telephonic Transmission. Louis Cohen. Discusses this phase of the problem, showing the distortion produced by terminal apparatus, and considering certain

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improvements. Mathematical. 1500 w. Bul Bureau of Stand—Nov., 1908. No. 1346 N.

Reflection of Waves in Telephone Lines (Reflexionen in Fernsprechleitungen). F. Breisig. Mathematical discussion. Ills. 3000 w. Elektrotech Zeitschr—Dec. 17, 1908. No. 2113 D.

The Condenser in Telephony. G. M. B. Shepherd. A short description of their use and applications in this field. 2200 w. Elec Engng—Nov. 5, 1908. No. 308 A.

Neutralizing Transformers for Telephone Lines Paralleling Single-Phase Electric Railways. Abstract of article by J. H. Cannon, in Purdue Eng. Rev., describing the methods of eliminating disturbances in the telephone lines paralleling N. Y., N. H. & H. single phase system. Ills. 850 w. Ry & Engng Rev—June 5, 1909. No. 5371.

New Telephone Installations in Paris (Nouvelles Installations Téléphoniques de Paris). H. E. A. André. Describes interesting features of practice, apparatus, installations, etc. Ills. 2100 w. Bul Soc Int d Elecns—June, 1909. No. 6505 F.

The Telephone Problem in France (Le Problème Téléphonique actuel en France). Albert Turpain. Discusses faults of practice and the lessons to be learned from the recent destruction by fire of a large exchange in Paris. 3200 w. Rev Gen des Sci—Dec. 30, 1908. No. 1918 D.

The Central Battery System and its Application to Paris (Le Système Téléphonique à Batterie Centrale; son Application à Paris). Eugène H. Weiss. Illustrated description of the system, the conditions in Paris and proposals for their improvement. 4500 w. Génie Civil—Oct. 3, 1908. No. 532 D.

The Arrangement of Party Lines in Austrian Telephone Practice (Die Einrichtung der Gesellschaftsanschlüsse im österreichischen Telephonbetriebe). Karl

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Fuchs. Serial, 1st part. 3300 w. Elektrotech u Maschinenbau—Oct. 18, 1908. No. 595 D.

Some Applications of the "Domophone" (Quelques Applications du Domophone). J. A. Montpellier. Describes this microphone, its installation and use in private telephone installations. Ills. 2500 w. L'Eclen—Feb. 27, 1909. No. 3333 D.

See also Communication, under STREET AND ELECTRIC RAILWAYS.

Telephotography.

Belin's Improved Apparatus for the Electrical Transmission of Pictures. Jacques Boyer. Illustrated description of this improved apparatus for the transmission of drawings and pictures. 1700 w. Sci Am—June 12, 1909. No. 5382.

A Novel Solution of the Problem of Telephotography. Dr. Alfred Gradenwitz. Brief illustrated description of the "teleautocopist," invented by Laurent Sémat. 700 w. Sci Am—Aug. 21, 1909. No. 7149.

Korn's Apparatus for Photographic Transmission. Louis Dubois. Illustrated detailed description. 1800 w. Elect'n, Lond—Jan. 22, 1909. Serial. 1st part. No. 2207 A.

A New System of Electric Telephotography and Its Possibilities for the Electrical Transmission of Living Pictures (Ein neues System der elektrischen Fernphotographie und die aus demselben sich ergebenden Aussichten der Uebertragung hebender Bilder auf elektrischem Wege). Robert Schönhofer. Illustrated description. 2000 w. Elektrotechniker—June 25, 1909. No. 6708 D.

Tele-Stereography.

Note on the Tele-Stereograph (Note sur le Télé-Stéréographe). M. E. Belin. Illustrated description of an apparatus for the telegraphic reproduction of any document containing lines in relief however slight. 2000 w. Bul Soc d'Encour—Dec., 1908. No. 2622 G.

DISTRIBUTION

Autotransformers.

The Autotransformer. R. H. Fenkhausen. Describes types and their applications. Ills. 1000 w. Power—Nov. 17, 1908. No. 292.

Buffalo, N. Y.

Electricity in Buffalo, N. Y. George J. Kirchgasser. Information in regard to

the distribution and the extensive use made of electricity brought from Niagara Falls. 3000 w. Elec Wld—May 6, 1909. No. 5031.

Chemical Works.

Electrical Equipment of the Bergenport Chemical Works. Warren H. Miller. Description of a plant of interest because of the size of the installation units, and the

ELECTRICAL ENGINEERING

Circuit Breakers

acid corrosive problems. 2500 w. Elec Wld—Feb. 25, 1909. No. 2872.

Circuit Breakers.

Trip Coils for Alternating Current Automatic Circuit Breakers. C. C. Garrard. Gives experimental results, considering whether it is not desirable to work entirely with a. c. coils. 1500 w. Elect'n, Lond—Feb. 19, 1909. No. 2877 A.

Condensers.

Some Tests and Uses of Condensers. W. M. Mordey. Discusses whether condensers can be used commercially in competition with over excited synchronous motors for the improvement of power factor in distribution. Also discusses use of condensers to extinguish arcs. Read before Institution of Elec. Engrs. Discussion. 6300 w. Elect'n, Lond—May 28, 1909. No. 5269 A.

Current Rectifiers.

The Mercury Rectifier. R. P. Jackson. Describes its operation, application, and related matters. Ills. Discussion. 4000 w. Pro Engrs' Soc of W Penn—Dec., 1908. No. 1743 D.

Recent Applications of the Mercury-Arc Rectifier. P. D. Wagoner. Explains the theory and describes some of the applications. Ills. 2000 w. Stevens Ind—Jan., 1909. No. 3813 D.

The Constant Current Mercury Arc Rectifier. Charles J. Mundo. Description of such a set, explaining its operation. Diagrams. 2200 w. Harvard Engng Jour—June, 1909. No. 5993 D.

A New Accumulator-Charging Apparatus. Illustrated description of the "Premier" rectifier, and the means of obtaining direct-current from an alternating supply. 1800 w. Auto Jour—Sept. 11, 1909. No. 7845 A.

Solid Rectifiers. Greenleaf W. Pickard. Reviews the work of other investigators and the writer's study of the action of contacts of small arcs between dissimilar conductors. 4000 w. Elec Rev, N Y—Feb. 20, 1909. No. 2555.

Fuses.

Some Considerations in Designing Heavy Capacity Fuses. Louis W. Downes. Considers the subject theoretically, giving calibration tests supporting some of the deductions, and explains the actual operation of the fuse under short-circuit. 4000 w. Pro Am Inst of Elec Engrs—July, 1909. No. 6494 F.

Discussion on "Some Considerations in Designing Heavy Capacity Fuses." Dis-

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cussion at Frontenac, N. Y., of paper by Louis W. Downes. 2200 w. Pro Am Inst of Elec Engrs—Oct., 1909. No. 8540 F.

Industrial Plants.

Electrical Distribution Systems for Industrial Plants. Warren H. Miller. Why 440 volts is the preferred layout, with suggestions for its installation. 4000 w. Elec Wld—Nov. 7, 1908. No. 95.

Transmission and Maintenance of Electric Service for Industrial Plants. C. T. Maynard. Discusses water-power with steam auxiliary with special reference to mill and shop work. 2500 w. Elec Wld—Oct. 7, 1909. No. 8397.

Insulation.

Insulating Materials. Thomas Germann and Stanley M. Hills. Abstract of a paper on "The Use of Dielectrics and the Principal Tests Applied to Them," read before the Jun. Inst. of Engrs. Examines the qualities of a good insulator and discusses some of the materials used. 3000 w. Mech Engr—April 9, 1909. No. 4030 A.

The Linseed Oil Fallacy. Gives facts showing that its oxidation unfits for electrical uses. 1000 w. Elec Rev, Lond—March 5, 1909. No. 3150 A.

See also Wiring, under DISTRIBUTION.

Motor Circuits.

Supply Circuits for Electric Motors. Cecil P. Poole. Gives a method of finding the correct size of wire, or the loss in a motor circuit. 3500 w. Power—July 27, 1909. No. 6740.

Regulations.

Factory and Workshop Act, 1901.—Rules for Electricity in Factories and Workshops. A copy of revised regulations as given in the report of Mr. James Swinburne. 5500 w. Elec Engr, Lond—Jan. 22, 1909. No. 2203 A.

Switchboards.

See same title, under GENERATING STATIONS.

Switches.

Electric Switches. W. B. Kouwenhoven. Explains various kinds of electric switches and the important factors that enter into their design. Ills. 2000 w. Ry & Loc Engng—Feb., 1909. No. 2267 C.

Oil Switches and Oil Circuit Breakers. William B. Kouwenhoven. Illustrated detailed description, explaining methods of operating. 2500 w. Ry & Loc Engng—March, 1909. No. 2941 C.

Recent Low-Tension Apparatus (Neuerungen im Apparatebau für niederspan-

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Wiring

DYNAMOS AND MOTORS

A. C. Dynamos

nung). Describes the apparatus manufactured by the Paul Meyer Company, Berlin. The first parts deal with switches and circuit breakers. Ills. Serial. 1st part. 1000 w. *Elektrotechniker*—Sept. 10, 1909. No. 8699 D.

The Design of Contact Springs and Contact Brushes for Switching Apparatus (Studien über die Berechnung der Kontaktfedern und Kontaktbürsten für Schaltapparate). Robert Edler. Discusses the calculation and standardization of apparatus of this type. Ills. Serial. 1st part. 4800 w. *Elektrotech u Maschinenbau*—Dec. 6, 1908. No. 1994 D.

See also Transformers, under TRANSMISSION.

Wiring.

Wiring a Finished Dwelling Without Defacement. Illustrated description of methods used in a house in New York. 1200 w. *Elec Wld*—Jan. 7, 1909. No. 1672.

Wiring of High-Grade Apartment House. N. M. Schoonmaker. Illustrated description. 1200 w. *Elec Wld*—Sept. 30, 1909. No. 8252.

Wiring of the Babbitt Soap Factory at Babbitt, N. J. Illustrated detailed description of the wiring of a group of factory buildings for power and lighting. 1500 w. *Elec Wld*—April 1, 1909. No. 3750.

The Electrical Equipment of the Mutual Benefit Life Building of Newark, N. J. Illustrated description. 2500 w. *Elec Wld*—Aug. 19, 1909. No. 7172.

Louisiana Electricians' Licensing Law. T. S. McLoughlin. A criticism and discussion of the 1908 State law licensing

electricians. 2000 w. *Elec Wld*—April 15, 1909. No. 3945.

The Craze for Cheap Wiring. S. G. Castle Russell. Discusses interests likely to be affected by the adoption of cheap wiring methods, and the systems proposed. 3500 w. *Elec Rev, Lond*—Jan. 8, 1909. No. 1806 A.

The Wiring of Buildings. D. S. Munro. Abstract of paper read before the Glasgow Soc. of the Inst. of Elec. Engrs. Reviews the various methods of wiring in proof that no really good and cheap method has yet been invented. 1400 w. *Elect'n, Lond*—Jan. 29, 1909. No. 2348 A.

Conduit Wiring. L. M. Waterhouse. Deals with some points in conduit wiring installations, and the materials required. Short discussion. 8500 w. *Elec Engr, Lond*—Jan. 22, 1909. No. 2201 A.

Insulation and Wiring. W. H. F. Murdoch. A criticism of some of the required tests in the revised regulations of the Inst. of Elec. Engrs. 800 w. *Elec Rev, Lond*—Feb. 26, 1909. No. 3052 A.

The Wiring Problem in Its Relation to Electricity Supply. Discusses present conditions in England, and the present wiring systems, suggesting improvements needed and describing recent systems tried. 3300 w. *Elect'n, Lond*—April 2, 1909. No. 3897 A.

Utilization of Electrical Energy. Gives general rules adopted for wiring in Victoria. 2500 w. *Aust Min Stand*—Jan. 20, 1909. Serial, 1st part. No. 3045 B.

See also Signalling, under RAILWAY ENGINEERING, CONDUCTING TRANSPORTATION.

DYNAMOS AND MOTORS

A. C. Dynamos.

Comparative Weights and Costs of Alternating and Continuous-Current Generators. A. G. Ellis. Investigation to determine the relative weights and costs and the influence on the rated speed and output. 2000 w. *Elec Engng*—Dec. 31, 1908. No. 1690 A.

The Relative Proportions of Copper and Iron in Alternating- and Continuous-Current Generators. A. G. Ellis. Explains the preponderance of copper in a. c. designs as compared with a. c. designs and other comparisons. 1700 w. *Elec Engng*—Jan. 7, 1909. No. 1803 A.

Deformation of Pressure Curves Due to Load in Alternate Current Generators.

Egon Siedek. An oscillographic investigation of the effect of armature reaction in alternators. 1200 w. *Elect'n, Lond*—Jan. 15, 1909. No. 2071 A.

Induced Pressures in the Exciting Winding of Single-Phase Dynamos (Betrachtungen über die in der Erregerwicklung von Einphasengeneratoren induzierten Spannungen). H. Brühn. A mathematical discussion. Ills. 2500 w. *Elektrotech u Maschinenbau*—Jan. 3, 1909. No. 2825 D.

The E. M. F.s Induced in the Exciting Winding of Single-Phase Alternators. H. Brühn. Abstract from *Elektrotechnik und Maschinenbau*. Gives results of investigations showing that in addition to the e. m.

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A. C. Dynamos

DYNAMOS AND MOTORS

A. C. Motors

f. which appears at the slip-rings other e. m. f.s exist inside the windings. 1500 w. *Elect'n*, Lond—April 16, 1909. No. 4196 A.

Electromotive Force Wave-Shape in Alternators. Comfort A. Adams. An application of the methods of connecting the shape of the flux-distribution curve with the e. m. f. wave shape, developed by the writer, with an illustration taken from Mr. Bache Wiigs paper. 3500 w. *Pro Am Inst of Elec Engrs*—July, 1909. No. 6488 F.

Voltage Wave-Form of Delta-Connected Alternator. Shiro Sano. A mathematical study. 400 w. *Elec Wld*—Oct. 14, 1909. No. 8555.

Effects of a Third Harmonic in the E. M. F. Wave of a Three-Phase Generator. F. M. Denton. Also editorial. Considers the subject from an oscillographic point of view, and contains a plea for star-wound armatures as contrasted with delta-wound. 2500 w. *Elec Wld*—Oct. 14, 1909. No. 8556.

"Phasing" Alternating Current Generators. F. J. Foote. Gives curves explaining principles involved. 1500 w. *Power*—June 15, 1909. No. 5494.

Fluctuations in the Speed of the Rotors of Alternators Operating in Parallel. George H. Shepard. An analysis of the interactions of two alternators in parallel explaining the means that may be employed for stopping the enlargement of the angle of phase displacement while it is still very small. 1800 w. *Elec Wld*—Jan. 28, 1909. No. 2126.

The Parallel Operation of Direct Connected Alternators. A. E. Buchenberg. Discusses the conditions necessary for parallel operation, and the problems in connection. 1500 w. *Elec Wld*—Dec. 5, 1908. No. 808.

Parallel Operation of Alternators. Dr. E. Rosenberg. Read before the Manchester Sec. of Inst. of Elec. Engrs. A study of the problem from the theoretical point of view, and showing how the results may be employed. 5500 w. *Elec Engr*, Lond—Jan. 29, 1909. Serial. 1st part. No. 2343 A.

The Operation of Alternators in Parallel. Joseph W. Anson. A detailed account of the writer's experience while controlling large alternating-current units running in parallel. 2000 w. *Elect'n*, Lond—Sept. 10, 1909. No. 7859 A.

The Function of the Damping Device in the Parallel Operation of Alternating Current Machines (Die Wirkung des Dämpfers bei parallel arbeitenden Wechs-

elstrommaschinen). Iwan Dory. Ills. 2800 w. *Elektrotech u Maschinenbau*—April 4, 1909. No. 5066 D.

A Method of Compounding Alternators by Means of Condensers. W. Linke. Trans from *Elektrotechwirsche Zeit*. Describes interesting tests on a small machine. 600 w. *Elec Engr*, Lond—July 2, 1909. No. 6292 A.

Triple-Frequency Currents in Neutrals of Three-Phase Star Connected Alternators. E. W. Marchant and J. K. Catterson-Smith. Shows how such currents arise, their effects, and indicates means for rendering the effects negligible. 1800 w. *Elect'n*, Lond—Aug. 6, 1909. No. 7091 A.

Leakage Reactance. J. Rezelman. Deals with the leakage reactance of the stator windings of alternating-current machines, the rotors being removed. Ills. 2500 w. *Elect'n*, Lond—Aug. 20, 1909. Serial. 1st part. No. 7436 A.

Calculation of Iron Losses in Dynamo Electric Machinery. G. E. Hanssen. Explains a method of predetermining the total iron loss. Ills. 1500 w. *Pro Am Inst of Elec Engrs*—June, 1909. No. 5832 F.

Comparative Costs of 25-Cycle and 60-Cycle Alternators. Carl J. Fechheimer. Aims to eliminate as far as possible the variables encountered in analyzing conditions affecting cost. 2000 w. *Pro Am Inst of Elec Engrs*—June, 1909. No. 5833 F.

Alternator for One Hundred Thousand Cycles. E. F. W. Alexanderson. Briefly reviews the history of the high-frequency alternator, and describes features of a recent machine. Ills. 2500 w. *Pro Am Inst of Elec Engrs*—June, 1909. No. 5837 F.

The Rational Selection of Alternating-Current Generators. F. D. Newbury. Calls attention to the important characteristics of the alternator, and discusses factors determining the selection for a required service. 5000 w. *Elec Jour*—Oct., 1909. No. 8525.

A. C. Motors.

The Current and Output of Alternating Current Motors. Paul C. Percy. Explanation of method of determining the relation between the current and output. 1200 w. *Power*—Dec. 22, 1908. No. 1078.

Types of Alternating-Current Commutator Motors and the Best Frequency for Railways. F. Eichberg. Investigates the influence of the frequency on the generators, transformers, transmission line, and more especially on single-phase commu-

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A. C. Motors

DYNAMOS AND MOTORS

A. C. Turbo-Generators

tator motors. 2500 w. Elect'n, Lond—Aug. 20, 1909. No. 7435 A.

Alternating Current Electric Motors Snowden B. Redfield. Illustrates and describes the distinguishing features of construction, characteristics of operation, and uses of the squirrel cage, slip ring induction and synchronous motors. 2000 w. Am Mach—Vol. 32. No. 18. No. 4518.

The Single-Phase Commutator-Type Motor. B. G. Lamme. From a paper before the Phila. Sec. of the Am. Inst. of Elec Engrs. Explains the cause of trouble in commutating alternating currents and the problems encountered in designing such motors. 4500 w. Elec Jour—Jan., 1909. No. 1842.

Improvement of Power-Factor and Commutation Conditions in Single-Phase Series Motors. A. S. McAllister. Discusses methods of overcoming disadvantageous conditions with reference to the low power-factor and sparking. 5000 w. Jour Fr Inst—July, 1909. No. 6354 D.

The Calculation of Single-Phase Commutator Motors. J. Fischer-Hinnen. Abstract from *Elektrotechnische Zeitschrift*. Treats the subject from a practical standpoint and is devoted to the calculation and design of these machines. 2500 w. Elect'n, Lond—Sept. 24, 1909. No. 8345 A.

The Rotating-Field Theory of the Single-Phase Commutator Motor (Drehfeldtheorie der Einphasenkollektormotoren). Friedrich Schmidt. Mathematical. Ills. 4000 w. Elektrotech u Maschinenbau—Sept. 26, 1909. No. 8903 D.

Vector Diagram for Changing Pole Connections on Three-Phase Motors (Vektordiagramme für Drehstrommotoren mit Polumschaltung). Herr Schnackenburg. Illustrated discussion. 1200 w. Elek Kraft u Bahnen—April 14, 1909. No. 5063 D.

Single-Phase Commutator Motors (Eenphase - wisselstroom - collectormotoren). C. Feldmann, K. H. Haga and C. Noome. A review of their theory and development and of present types. Ills. Serial, 1st part. 12400 w. De Ingenieur—March 20, 1909. No. 4376 D.

Reduction in Capacity of Polyphase Motors Due to Unbalancing in Voltage. S. B. Charters, Jr., and W. A. Hillebrand. Reports a series of tests to determine their performance under other than ideal conditions. 2500 w. Pro Am Inst of Elec Engrs—June, 1909. No. 5831 F.

Discussion on "Reduction in Capacity of Polyphase Motors Due to Unbalancing in Voltage." The paper by S. B. Charters, Jr., and W. A. Hillebrand is discussed at

Frontenac, N. Y. 3000 w. Pro Am Inst of Elec Engrs—Oct., 1909. No. 8543 F.

The Separation of Stator Losses in Three-Phase Motors by Means of the Hysteresis Angle (Die Trennung der Statorverluste des dreiphasigen Motors durch Ermittlung des Hysteresiswinkels). Hermann Zipp. Describes a simple means of separating the hysteresis and eddy-current losses. Ills. 1600 w. Elektrotech u Maschinenbau—Nov. 8, 1908. No. 1185 D.

A Simple Method of Deriving the Heyland and Ossanas Circle Diagram (Ueber eine einfache Ableitung des Heylandschen und Ossanaschen Kreises). W. Rogowski. Mathematical. Ills. 2100 w. Elektrotech u Maschinenbau—May 30, 1909. No. 5960 D.

A New Six-Speed Motor, and the Application of Multi-Speed Motors to Cloth Pressing Machines (Neuer sechsstufiger Motor und die Verwendung der Stufenmotoren zum Antrieb von Stoffdruckmaschinen). O. Knöpfli. Illustrated description. Serial. 1st part. 2500 w. Elek Kraft u Bahnen—Feb. 4, 1909. No. 4802 D.

Three-Phase Device for Driving Phonograph and Moving-Picture Machines. Francis M. Weldon. Illustrated description of a device for operating a phonograph and moving-picture machine in order to produce the image and sounds at the same time. 1200 w. Elec Wld—July 29, 1909. No. 6762.

New Five and Six-Speed Three-Phase Motor. Describes new design of the Maschinenfabrik Oerlikon. 2000 w. Elect'n, Lond—Aug. 27, 1909. No. 7646 A.

The Starting Torque of Three-Phase Motors, with Squirrel-Cage Rotors. Max Kloss. Aims to show the relations between the starting torque and the slip. 5000 w. Elect'n, Lond—Sept. 17, 1909. No. 8112 A.

See also Railway Motors, under DYNAMOS AND MOTORS.

A. C. Turbo-Generators.

Practical Considerations in the Selection of Turbo-Alternators. M. Kloss. Abstract of paper before the Manchester Loc. Sec. of Inst. of Elec. Engrs. Deals with ventilation, voltage regulation and power factor. 2500 w. Elect'n, Lond—Nov. 6, 1908. No. 315 A.

Tests on a 2500-K.-V.-A. Curtis Turbo-Alternator. A report of tests made at the Aberman Power Station of the Powell Duffryn Co. 600 w. Ills. Engng—July 23, 1909. No. 6854 A.

ELECTRICAL ENGINEERING

Air Gaps

Turbo-Generators (Turbodynamos und Turboelektromotoren). F. N'ethammer. Describes and discusses the leading types of alternating-current machines. Ills. Serial, 1st part. 7200 w. Zeitschr d Ver Deutscher Ing—June 26, 1909. No. 6730 D.

See also Turbine Tests, under MECHANICAL ENGINEERING, STEAM ENGINEERING.

Air Gaps.

A Diagram for Correction Coefficients for Air-Gap Reluctances. T. C. Baillie. Quotes experiments verifying Carter's formula, and gives a diagram from which the coefficients can be read. 500 w. Elect'n, Lond—Jan. 8, 1908. No. 1807 A.

Armature Cooling.

Radial Cooling of Dynamo Armatures (Ueber die radiale Kühlung von Dynamoankern). G. Ossanna. A mathematical discussion of its possibilities. Ills. 2100 w. Elektrotech u Maschinenbau—May 23, 1909. No. 5956 D.

Armature Reactions.

Experimental Analysis of Armature Reaction. Dr. Gisbert Kapp. Abstract of a communication to the Inst. of Elec. Engrs. Describes two tests for separating the reactance voltage and the drop produced by armature back excitation in a polyphase armature. 2500 w. Elect'n, Lond—June 4, 1909. No. 5517 A.

Armatures.

Alternator Armature Windings. Edgar Knowlton. Gives methods of determining the correctness of armature connections, principally when the connections are unsymmetrical. 700 w. Elec Wld—July 1, 1909. No. 6107.

The Tips of Teeth on Armature Cores. Miles Walker. Deals with the main considerations controlling the design of tips of teeth and the effect of the shape on the magnetic leakage. 1200 w. Elect'n, Lond—Oct. 1, 1909. No. 8484 A.

Automobile Motors.

See Electric, under MECHANICAL ENGINEERING, AUTOMOBILES.

Brakes.

Friction Brakes. Henry D. James. Aims to show the importance of careful design and application of friction brakes to suit stated conditions. Ills. 1700 w. Elec Jour—Jan., 1909. No. 1844.

Dynamic Braking. C. E. Daniells. An explanation of the generator action that causes the braking effect, and the advan-

DYNAMOS AND MOTORS

Condensers

tages and applications of dynamic braking. 1200 w. Elec Wld—Oct. 7, 1909. No. 8399.

Brushes.

The Mechanics of Brushes (Beiträge zur Mechanik der Bürsten). C. Richter. A discussion of the theoretical mechanics of brushes sliding on a commutator, the conditions of equilibrium, etc. Ills. Serial. 1st part. 4000 w. Elektrotech u Maschinenbau—Jan. 10, 1909. No. 2828 D.

See also Lubrication, under DYNAMOS AND MOTORS.

Commutation.

Commutation Phenomena. Carlton L. Kennedy. Diagrams and explanation of what is happening during commutation. 1500 w. Elec Wld—April 22, 1909. No. 4439.

Commutation in Continuous-Current Machines. H. E. Mellor. Explains the process of commutation in continuous-current machines. Ills. 3500 w. Mech Engr—Sept. 17, 1909. Serial. 1st part. No. 8117 A.

Commutation in Dynamo Electric Machines. R. Rüdenberg. Abstracted from *Elek. Zeit.* Considers the important part played by the paths in parallel with the armature coils as they leave short-circuits. 2000 w. Elect'n, Lond. Aug. 13, 1909. No. 7312 A.

Commutators.

Turning and Grinding Commutators. W. Burns. Directions for the work. 2000 w. Elec Wld—Feb., 1909. No. 2270.

The Performance of a Synchronous Commutator. J. B. Whitehead and L. O. Grondahl. An account of a series of experiments on a synchronously rotating commutator supplied, through collector rings, with alternating e. m. f. Ills. 4000 w. Elec Wld—April 15, 1909. No. 3944.

Some Remarks on Flatting and Blackening of Commutator Bars. Considers troubles which, if not rectified, render the machine unfit for service. 1000 w. Elec Rev, Lond—Jan. 15, 1909. No. 2064 A.

Turbo-Commutators. R. J. Roberts. Discusses points in their design and construction. 2200 w. Elect'n, Lond—May 7, 1909. No. 4719 A.

Condensers.

Condensers of Large Capacity (Kondensatoren grosser Kapazität). Günther Schulze. A discussion of their uses, construction and operation. Ills. 3200 w. Elektrotech u Maschinenbau—March 14, 1909. No. 4286 D

ELECTRICAL ENGINEERING

Controllers

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Controllers.

Automatic Control of Direct-Current Motors in Industrial Service. D. E. Carpenter. Remarks on the importance of selecting a proper controller with an illustrated description of a type of magnet switch controller and its operation. 3000 w. Elec Jour—Jan., 1909. No. 1843.

Application of Automatic Controllers to Direct-Current Motors. D. E. Carpenter. Outlines some of the applications to specific services. The present article deals with elevator control. Ills. 1700 w. Elec Jour—Feb., 1909. Serial. 1st part. No. 2739.

Automatic Motor Control. H. E. White. Explains the methods by which the results are attained. 2000 w. Pro Am Inst of Elec Engrs—July, 1909. No. 6499 F.

Special Motor-Controlling Devices in the Rolling Mill of the Indiana Steel Company, Gary, Ind. Illustrated description. 1500 w. Elec Wld—July 8, 1909. No. 5222.

See also Electric Driving, under MECHANICAL ENGINEERING, POWER AND TRANSMISSION.

Cooling.

The Advantages of Forced Draft in Generators and Motors. Alex. Churchward. Detailed discussion of the advantages to be gained. 1000 w. Elec Wld—May 13, 1909. No. 5039.

Dampeners.

Some Casual Remarks on Dampeners. Warren H. Miller. Illustrates types, discussing their merits and defects. 2500 w. Elec Wld—Sept. 30, 1909. No. 8250.

Design.

Calculation of Wire for Shunt Field Circuit. A. M. Bennett. Gives chart for finding the nearest proper size of wire for a given m. m. f. in ampere-turns, shunt field voltage and number of poles. 900 w. Elec Wld—Nov. 14, 1908. No. 227.

D. C. Dynamos.

The D. C. Transverse-Field Dynamo and Its Applications (Die Gleichstrom-Querfeldmaschine und ihre Anwendungen). Richard Neumann. Discusses particularly its application to electric train lighting. Ills. 4500 w. Zeitschr d Ver Deutscher Ing—Jan. 23, 1909. No. 2839 D.

See also A. C. Dynamos, under DYNAMOS AND MOTORS.

D. C. Motors.

Design of a One-Sixth Horse-Power

Motor. F. C. Mason. Drawings and description of a motor designed to operate a window display machine. 1200 w. Elec Wld—Dec. 5, 1908. No. 811.

Auxiliary Poles for Direct-Current Machines. John N. Dodd. Discusses their electrical design and method of testing. Diagrams. 4500 w. Pro Am Inst of Elec Engrs—May, 1909. No. 4999 F.

The Installation of Direct-Current Motors. R. H. Fenkhausen. Gives directions for setting up and operating motors, with some general rules. Ills. 2500 w. Power—Feb. 9, 1909. No. 2377.

Reversing Direct-Current Machines. F. P. M'Dermott, Jr. Shows the application of some rules for studying these problems. 1600 w. Power—April 13, 1909. No. 3921.

Location and Repair of Troubles in Direct Current Motors. R. H. Fenkhausen. Gives tests for locating and directions for speedy repairs. Ills. 1500 w. Power—May 11, 1909. No. 4585.

Regulating and Braking Resistances for D. C. Motors (Ermittlung der Regulier- und Bremswiderstände für Gleichstrommotoren). Hermann Zipp. Mathematical and theoretical. Serial, 1st part. Electro-techn Rundschau—Feb. 3, 1909. No. 3554 D.

A New Method for Regulating the Speed of Induction Motors, and Its Applications. C. Krämer. Abstract translation from *Elek. Zeit.* Describes a method where energy is taken from the rotor and supplied to the axis of the asynchronous machine as mechanical energy. 1500 w. Elect'n, Lond—March 5, 1909. No. 3152 A.

The Series Motor as a Load Equalizer (Ausgleich von Belastungsschossen mittels einer Reihenschlussmaschine). Thomas Roskopf. Mathematical. Ills. 1500 w. Elek Kraft u Bahnen—April 24, 1909. No. 5064 D.

See also Controllers, Railway Motors, and Starting, under DYNAMOS AND MOTORS; and Electric Power, under MINING AND METALLURGY, MINING.

Economy.

Output and Economy Limits of Dynamo-Electric Machinery. J. C. Macfarlane and H. Burge. Considers present day practice and the directions in which extensions may be expected. 9500 w. Inst. of Elec Engrs—Dec. 10, 1908. No. 1206 N.

Failures.

Typical Electric Motor Failures. Discusses a number of recent failures and ways of avoiding them. 2200 w. Elec Wld—Nov. 7, 1908. No. 96.

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Flux Density

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Flux Density.

A Graphical Method for Determining the Flux Density in Teeth. F. Blanc Abstract translation from *Elek. Zeit.* Shows the limitations of ordinary methods and describes the graphical method of determining the required ampere-turns. 1200 w. *Elect'n, Lond*—April 23, 1909. No. 4451 A.

Heating.

Determination of the Time Constant and the Stationary Temperature of Electrical Machines (Die Ermittlung der Zeitkonstante und der stationären Temperatur elektrischer Maschinen). Gustav Benischke. Mathematical discussion of heating and cooling problems. Ills. 2000 w. *Elektrotech u Maschinenbau*—Jan. 10, 1909. No. 2827 D.

See also Windings, under DYNAMOS AND MOTORS.

High-Voltage Dynamos.

High-Voltage Generators. Frank Koester. Illustrates and describes designs constructed and operated in Continental Europe. 1500 w. *Elec Wld*—Sept. 16, 1909. No. 7773.

Induction Motors.

A Sketch of the Theory of the Adjustable-Speed, Single-Phase, Shunt Induction Motor. F. Creedy. Discusses the variation of the speed of these machines from synchronism. 7500 w. *Pro Am Inst of Elec Engrs*—July, 1909. No. 6490 F.

The Single Phase Induction Motor. R. H. Fenkhausen. Gives the characteristics of this type, with a comparison of various methods of starting. Ills. 1500 w. *Power*—Aug. 10, 1909. No. 6995.

The Current Locus of the Single-Phase Induction Motor. A. S. Langsdorf. Mathematical treatment giving experimental results. 1500 w. *Pro Am Inst of Elec Engrs*—July, 1909. No. 6484 F.

The Heating of Induction Motors. A. Miller Gray. Shows the limitations imposed on the designer of induction motors by the heating of the machine, and how this heating may be predetermined. 3000 w. *Pro Am Inst of Elec Engrs*—June, 1909. No. 5834 F.

Discussion on "The Heating of Induction Motors." Discussion at Frontenac, N. Y., of the paper of A. Miller Gray. 900 w. *Pro Am Inst of Elec Engrs*—Oct., 1909. No. 8537 F.

Induction Motor Characteristics and Their Relation to Its Application. J. W. Rogers. An illustrated article discussing

the choice of motors for the operation of machinery. 4000 w. *Cassier's Mag*—July, 1909. No. 6347 B.

Multispeed Induction Motors. H. G. Reist and H. Maxwell. The methods of varying the speed are briefly considered and the design and selection of types discussed. 2000 w. *Pro Am Inst of Elec Engrs*—July, 1909. No. 6497 F.

Discussion on "Multispeed Induction Motors." Discussion at Frontenac, N. Y., of paper by H. G. Reist and H. Maxwell. 2000 w. *Pro Am Inst of Elec Engrs*—Oct., 1909. No. 8536 F.

Speed Control of Induction Motors by Frequency Changers. H. C. Specht. Describes methods, explaining principles upon which they are based. 2500 w. *Elec Jour*—Oct., 1909. No. 8527.

Speed Control of Induction Motors by Cascade Connection. H. C. Specht. Describes different schemes for possible speed combinations in a cascade set and considers the performances. 2500 w. *Elec Jour*—July, 1909. No. 6438.

Application of Induction Motors in Cascade Connection as Compared with Single Multi-Speed Induction Motors. H. C. Specht. Considers the principles of their application by means of examples. 2200 w. *Elec Jour*—Aug., 1909. No. 7026.

The "Spinner" Induction Motor. Illustrates and describes this recent development in variable speed induction motors, giving some applications. 1500 w. *Engr, Lond*—April 9, 1909. No. 4041 A.

Characteristics of the "Spinner" Motor. Selby Haar. Gives an explanation of arrangements for high and for low speed. 1200 w. *Elec Wld*—Sept. 6, 1909. No. 7774.

Magnetizing and Potential Coefficients of Polyphase Windings. R. E. Hellmund. Gives results obtained by the writer's method, with data relating to fractional-pitch windings. 800 w. *Elec Wld*—Dec. 19, 1908. No. 1269.

Torque and Speed Relations in Polyphase Induction Motors. A. S. McAllister. Gives a diagram which represents the complete performance of an induction motor, discussing the effect upon the torque of changing the secondary resistance of a motor without altering the design proportions. 1200 w. *Elec Wld*—April 22, 1909. No. 4438.

Methods of Starting Large Three-Phase Induction Motors. J. W. Rogers. Briefly describes the construction of such motors and the methods employed for starting them. 2500 w. *Prac Engr*—Jan. 15, 1909. No. 2050 A.

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The Effect of the Starting Characteristics Upon the Operation of an Induction Motor. M. Berthold. Outlines the changes in design proportion that affect the torque relations, with particular reference to the polyphase squirrel-cage type of machine. 2000 w. Elec Wld—April 22, 1909. No. 4437.

The Application of the No-Load and Short-Circuit Diagram to the Design and Testing of Induction Motors. Stanley P. Smith. Describes a diagram by means of which the efficiency, torque, power factor, slip, etc., can be accurately determined. 3000 w. Elect'n. Lond—May 7, 1909. Serial. 1st part. No. 4720 A.

A New Method for Regulating the Speed of Induction Motors, and Its Applications. C. Krämer. Abstract translation from *Elek. Zeit.* Describes a method where energy is taken from the rotor and supplied to the axis of the asynchronous machine as mechanical energy. 1500 w. Elect'n, Lond—March 5, 1909. No. 3152 A.

Investigation and Calculation of the Additional Iron Losses in Induction Motors. O. S. Bragsted and Fraenckel. Abstract trans. from *Elektrochemische Zeit.* Investigates the origin of these losses and deduces formulæ for calculating the same. 1500 w. Elect'n, Lond—April 2, 1909. No. 3898 A.

Investigation and Determination of the Additional Iron Losses in Induction Motors (Untersuchung und Berechnung der zusätzlichen Eisenverluste in asynchronen Motoren). O. S. Bragstad and A. Fraenckel. Mathematical. Ills. Serial. 1st part. 2100 w. Elektrotech Zeitschr—Nov. 5, 1908. No. 1198 B.

Some Graphical Solutions to Three-Phase Problems. Leonard Solomon. Gives a graphical method of calculating the resistances to be inserted in the rotor circuit in two cases, based on the Heyland diagram. 1200 w. Elect'n, Lond—Jan. 15, 1909. No. 2068 A.

A Graphical Treatment of the Induction Coupling (Die graphische Behandlung der Induktionskupplung). Hermann Zipp. An exhaustive theoretical discussion. Ills. Serial. 1st part. 3000 w. Elek Kraft u Bahnen—Sept. 14, 1909. No. 8906 D.

Belt-Leakage in Induction Motors. R. E. Hellmund. Aims to investigate and demonstrate, in a general way, the characteristics of belt-leakage. 3000 w. Elec Rev, N Y—Jan. 2, 1909. No. 1469.

See also Starters, under DYNAMOS AND MOTORS.

DYNAMOS AND MOTORS

Interpoles.

The Interpole for Railway Motors. W. B. Kouwenhoven. Explains the action of the interpole in preventing sparking and prolonging the life of the commutator and brushes. Diagrams. 2000 w. Ry & Loc Engng—Oct., 1909. No. 8301 C.

Experimental Method of Adjusting Interpole Windings. Howard M. Nichols. Suggestions for the designing and adjustment of interpoles. 600 w. Elec Wld—Oct. 7, 1909. No. 8398.

Some Notes on Commutating-Pole Design. E. O. Turner. Read before the Students' Sec. of the Inst. of Elec. Engrs. at Glasgow. Explains method of finding the necessary ampere-turns and the dimensions for the pole-shoe and pole-core. 2000 w. Elect'n, Lond—Jan. 15, 1909. No. 2067 A.

Interpole Designs. W. B. Hird. Read before the Glasgow Sec. of the Inst. of Elec. Engrs. Explains the principle of all interpole designs, discussing their use. General discussion. 6000 w. Elec Engr, Lond—May 21, 1909. No. 5184 A.

Interpole Generators and Motors. W. B. Hird. Explains the principle of interpole designs and the advantages of their use. 2000 w. Elec Engr, Lond—Oct. 1, 1909. No. 8480 A.

Lubrication.

Lubricating and Electric Brushes for Commutators and Collector Rings. E. O. Schweitzer. Describes a new type of lubricating brushes. Ills. 1200 w. Elec Rev, N Y—Sept. 18, 1909. No. 7838.

Motor Nomenclature.

Standardization of the Nomenclature of Electric Motors. J. M. Hipple. Gives the classification adopted by electric motor manufacturers, and urges its adoption generally. 1200 w. Elec Jour—Aug., 1909. No. 7027.

Pole-Face Losses.

Pole-Face Losses. Comfort A. Adams, A. C. Lanier, C. C. Pope, and C. O. Schooley. An account of experimental work to establish a reliable relation between the pole-face losses and the principal variables involved. 4500 w. Pro Am Inst of Elec Engrs—Aug., 1909. No. 7056 F.

Railway Motors.

Features of Continuous-Current Railway Motor Design. E. V. Pannell. The limiting dimensions for these motors is explained and features discussed. 1500 w. Elec Rev, Lond—Dec. 4, 1908. No. 1007 A.

Faults on Tramcar Motors. Spencer Robinson. Deals with the most practical

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means of locating the faults and repairing the damage. 1500 w. Elec Rev, Lond—April 2, 1909. No. 3896 A.

Notes on the Single-Phase Railway Motor. S. M. Kintner. Briefly considers its operation on direct and on alternating current. 1200 w. Elec Jour—May, 1909. No. 4547.

Single Phase Railway Motors (Les Alternomoteurs monophasés de Traction). M. Henry. An illustrated description of the various types, with details of the lines on which they are used. Serial, 1st part. 1500 w. Elecn—March 20, 1909. No. 4225 D.

Single-Phase Railway Motors (Les Alternomoteurs monophasé de Traction). M. Henry. A general review. The first part discusses the principal types, their characteristics, the choice of frequency, and efficiency. Ills. Serial. 1st part. 3500 w. L'Elecn—Dec. 19, 1908. No. 1923 D.

Alternating-Current Commutator Motors as Applied to Traction Work. M. Ostros. Abstract translation from *Elektrotechnische Zeit*. A report of an investigation of types. 1800 w. Elect'n, London—Oct. 23, 1908. Serial, 1st part. No. 73 A.

The Development and Construction of Motors and Driving Gears for Electric Cars (Entwicklung und Beschaffenheit der Triebmotoren und Triebwerke elektrischer Eisenbahnfahrzeuge). Dr. W. Kummer. Ills. Serial. 1st part. 3000 w. Schweiz Bau—Nov. 7, 1908. No. 1157 B.

Oerlikon Alternating-Current Railway Motors and Their Effects on Telephone Systems. Dr. Behn-Eschenburg. Gives results of general interest in single-phase traction, showing how difficulties have been overcome. 2500 w. Elect'n, Lond—May 21, 1909. No. 5186 A.

The Speed of Railway Motors (Ueber die Bemessung der Umdrehungszahl bei elektrischen Bahnmotoren). W. Kummer. A mathematical discussion of motor design to give a certain speed under specified load conditions. Ills. 3500 w. Schweiz Bau—June 12, 1909. No. 6579 B.

See also Interpoles, under DYNAMOS AND MOTORS.

Reactance Coils.

The Use of Reactance Coils in Generating Stations. P. Junkerfeld. Read before the N. E. L. A. Discusses the advisability of using reactance coils for protection of generators. Also editorial. 4500 w. Elec Age—June, 1909. No. 6129.

DYNAMOS AND MOTORS

Starters

Practical Design of Reactance Coils for Turbo-Generators. A. S. Loizeaux. Read before the N. E. L. A. Information in regard to designing, testing and operating. Ills. 2500 w. Elec Age—June, 1909. No. 6130.

Regulation.

Shunt Regulation by the "Potential Slide" Method. Thomas Carter. Notes on shunt regulators for motors and dynamos with abnormally high ranges of regulation. 2500 w. Elec Engr, Lond—Nov. 20, 1908. No. 731 A.

Repulsion Motors.

Repulsion Motor With Variable Speed Shunt Characteristics. E. F. W. Alexanderson. Presents the general principles of a theory for the a. c. shunt motors. Diagrams. 2000 w. Pro Am Inst of Elec Engrs—June, 1909. No. 5836 F.

Commutation of the Compensated Series Repulsion Motor. A. R. Dennington. Describes this alternating-current commutator motor, and states the advantages of the arrangement. 2500 w. Elec Wld—Dec. 12, 1908. No. 928.

Alternating Current Commutator Motors. Dr. Rudolf Goldschmidt. Discusses the theory of the repulsion motor, the methods of operation, and the determination of losses. Diagrams. 2200 w. Elect'n, Lond—Nov. 27, 1908. Serial. 1st part. No. 861 A.

Resistances.

Determination of Resistances by Graphics. F. W. Harris. Explains the development of the graphical method of designing resistances for motor control. 2000 w. Elec Jour—Oct., 1909. No. 8528.

Rheostats.

Submerged Wire Rheostat. P. M. Brown. Gives formulae found reliable for immersed wire rheostats using ordinary galvanized iron wire as a resistor. Ill. 800 w. Elec Wld—May 6, 1909. No. 5035.

Rheostats for Shunt Electrical Machines (Réostatos para Máquinas shunt.) Ricardo Caro. A mathematical discussion. Serial. 1st part. 3000 w. Energia Electrica—Feb. 10, 1909. No. 3347 D.

Rheostats for Series Machines (Réostatos para Maquinas serie). Ricardo Caro. Mathematical discussion. Serial. 1st part. 2000 w. Energia Elec—June 10, 1909. No. 6558 D.

Starters.

Recent Practice in the Design of Motor Starters. Illustrates and describes recent

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Starting

designs. 1000 w. *Prac Engr*—May 14, 1909. Serial, 1st part. No. 4948 A.

Rheostatic Starters for Induction Motors. Dr. Benjamin F. Bailey. A comparison of the rheostatic starter and the auto-starter. 2000 w. *Elec Wld*—Jan. 2, 1909. No. 1476.

Interlocked Motor Starters and Shunt Regulators. T. Golding and O. C. Dinerman. Illustrates and describes some of the methods adopted. 1500 w. *Elec Rev*, Lond—Oct. 15, 1909. No. 8866 A.

Current Load in the Individual Resistors in an Automatic Starter (Ueber die Strombelastung der einzelnen Widerstandsstufen der Selbstanlasser). Robert Edler. Mathematical. Ills. Serial, 1st part. 4000 w. *Elektrotech u Maschinenbau*—Sept. 5, 1909. No. 8900 D.

Starting.

A Comparison of the Methods of Starting Squirrel-Cage Induction Motors. Selby Haar. Analyzes the performance when started at lowered voltage obtained respectively by means of auto-transformers and of rheostats in the primary circuits. Also letter by Dr. C. P. Steinmetz. 1500 w. *Elec Wld*—March 11, 1909. No. 3086.

Auto-Transformers versus Rheostats for Induction Motor Starters. I. E. Hansen. Discusses some of the advantages and disadvantages of the two types. 1700 w. *Elec Wld*—Feb. 25, 1909. No. 2870.

See also Rheostats, under DYNAMOS AND MOTORS.

Synchronous Motors.

Self-Starting Synchronous Motors. Jens Bache-Wügg. An illustrated explanation of the starting performance of such motors. 2000 w. *Elec Jour*—June, 1909. No. 5548.

Turbo-Generators.

Tests of Turbo-Generators (Ueber Untersuchungen an Turbogeneratoren). Gives results of efficiency tests of Zoelly, Parsons and Curtis turbo-generators of various sizes. 2000 w. *Glückauf*—Nov. 21, 1908. No. 1153 D.

Turbo-Generators (Les Turbogénéatri-

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ces). An abstract of a paper by M. J. Frankfourte outlining the present status of their design. Ills. 3500 w. *Elec*n—April 17, 1909. No. 4825 D.

Vector Diagrams.

The Use of Arrow-Heads in Alternating-Current Vector Diagrams. A. S. Langsdorf. Explanations and examples aiming to remove the confusion often shown by students. 800 w. *Elec Wld*—Aug. 12, 1909. No. 7015.

Windings.

Factors Governing the Space Utilization of Electromagnetic Windings. Charles R. Underhill. Discusses some of the influences affecting the space utilization coefficient. 1200 w. *Elec Wld*—Jan. 14, 1909. No. 1789.

Repairing a Damaged Armature Winding. R. H. Fenkhausen. Illustrated description of methods. 1000 w. *Power*—May 4, 1909. No. 4488

Determination of the Leakage of Alternating-Current Windings. M. Schenkel. Abstract from *Elektrotechnik und Maschinenbau*. Shows how to obtain accurate results. 500 w. *Elect'n*, Lond—July 23, 1909. No. 6838 A.

Note on the Heating of Magnet Coils. G. Trevor Williams. Experimental separation of heat losses, showing that about one-half are dissipated by convection, and the remainder by radiation and conduction. 1200 w. *Elect'n*, Lond—Aug. 13, 1909. No. 7313 A.

Application of Shortened-Pitch Windings (Die Verwendung des verkürzten Wickelschrittes). F. Punga. Discusses their application to d. c. and three-phase generators and motors and to single-phase commutator motors. Ills. 3000 w. *Elektrotech u Maschinenbau*—June 13, 1909. No. 6715 D.

Temperature Distribution in Magnet Coils of Rectangular Section (Die Temperaturverteilung im Innern von Magnetspulen mit rechteckigem Querschnitt). Karl Humburg. Mathematical. Ills. Serial, 1st part. 2400 w. *Elektrotech u Maschinenbau*—July 18, 1909. No. 7463 D.

ELECTRO-CHEMISTRY

Alkalis.

See Chlorine, under ELECTRO-CHEMISTRY.

Calcium Carbide.

Calcium Carbide. C. A. Hansen. A paper before the Int. Cong. of Ap. Chem. A report of research work. Ills. 1200 w.

Elec-Chem & Met Ind—Oct., 1909. No. 8328 C.

The Manufacture of Calcium Carbide. A detailed description of the calcium-carbide factory at Odda, Norway. Ills. 4000 w. *Engng*—March 26, 1909. Serial 1st part. No. 3786 A.

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Calcium Cyanamide.

The Manufacture of Calcium Carbide (Le Carbone de Calcium, Etat actuel de la Fabrication). M. Pitaval. A historical résumé, with a review of the latest methods and apparatus. Ills. 4800 w. Génie Civil—Feb. 6, 1909. No. 3339 D.

Calcium Carbide (Le Carbone de Calcium). R. Pitaval. Discusses the economics of its manufacture. 2800 w. Génie Civil—March 27, 1909. No. 4237 D.

Practical Considerations on the Modern Electric Furnace for the Manufacture of Calcium Carbide (Considerazioni pratiche sui Forni elettrici moderni per la Fabricazione del Carbone di Calcio). Arturo Pavloni. Serial, 1st part. 1600 w. Elettricità—Feb. 11, 1909. No. 3348 D.

Calcium Cyanamide.

The Manufacture of Calcium Cyanamide (La Fabrication industrielle de la Cyanamide de Calcium). H. Marchand. A description of the various electrical methods. 3500 w. Rev Gen des Sciences—Dec. 30, 1908. No. 1919 D.

The Utilization of Atmospheric Nitrogen for the Production of Calcium Cyanamide and the Employment of the Latter in Agriculture and in Chemistry (L'Utilisation de l'Azote atmosphérique dans la production de la Cyanamide de Calcium et son Emploi en Agriculture et en Chimie). Albert Frank. Ills. 5000 w. Rev d'Electrochimie—Nov., 1908. No. 1910 F.

The Manufacture of Cyanamide in France and Its Use in Agriculture (La Cyanamide, la Fabrication française, son Role agricole). Ch. Pluvinaige. A general review of manufacture, properties, and uses. Ill. 4000 w. Bul Soc d'Encour—March, 1909. No. 4218 G.

The Actual State of the Cyanamide Industry (Etat actuel de la Fabrication de la Cyanamide). Robert Pitaval. Describes the process of manufacture, plants established, etc. Ills. 3500 w. Génie Civil—Aug. 21, 1909. No. 7936 D.

Cells.

Characteristics of Dry Cells. F. H. Loveridge. Read before convention of the Supts. of Telegraphs. Gives some of their characteristics and indicates what classes of service they are adapted to meet, and precautions necessary for their practical working. 3500 w. Sig Engr—July, 1909. No. 6435.

Three Years' Practice of the Townsend Cell. L. H. Baekeland. Read before the Int. Cong. of Ap. Chem., in London. Report from data gathered at

ELECTRO-CHEMISTRY

the Niagara plant. 2500 w. Elec-Chem & Met Ind—July, 1909. No. 6193 C.

See Standard Cells, under MEASUREMENT.

Chlorine.

The Electrolytic Chlorine and Alkali Industry (Etat actuel de l'Industrie du Chlore et des Alcalis électrolytiques). André Brochet. A review of methods and the present status of the industry. Ills. 5600 w. Bul Soc Int des Elecns—Dec., 1908. No. 1905 F.

Cleaning Baths.

Electric Cleaner for Use with Low Voltage Current. Describes its use for cleaning iron or steel to be plated. 1800 w. Brass Wld—March, 1909. No. 3444.

Corrosion.

The Corrosion of Iron and Steel. Alfred Sang. A study of the nature of corrosion, examining the theories advanced, and the relation of structure, stress, modern conditions, air, water, the electric current, etc., and the best means of protection. General discussion. 22000 w. Pro Engrs' Soc of W Penn—Jan., 1909. No. 2747 D.

The Corrosion of Iron. Abstract of a paper by Dr. William H. Walker on the "Corrosion of Iron and Steel and Modern Methods of Preventing It." 2800 w. Eng Rec—Feb. 20, 1909. No. 2571.

The Protection of Iron and Steel from Corrosion. William H. Walker. A discussion of principles, conditions and remedies. Ills. 4000 w. Engineering Magazine—May, 1909. No. 4341 B.

The Electrolytic Theory of the Corrosion of Iron and Its Applications. William H. Walker. Read before the I. and S. Inst. Explains this theory, showing that it includes the carbonic acid theory, and points out practical applications. Ills. 4500 w. Ir & Coal Trds Rev—May 14, 1909. No. 5135 A.

The Corrosion and Decay of Metals. J. T. Milton. Lecture at the Franco-British Ex. to the Inst. of Marine Engrs. Briefly considers the causes and the methods of protection, etc., showing that electric currents may be made to protect as well as to corrode. 3000 w. Mech Engr—Oct. 30, 1908. Serial, 1st part. No. 181 A.

Theory of Electrolytic Corrosion. A. F. Ganz. Explains the theory of electrolysis, and the way stray currents from electric railways cause electrolytic corrosion. 2500 w. Sib Jour of Engng—Oct., 1908. No. 353 C.

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Corrosion

Corrosion of Iron and Steel. Edward Crowe. Abstract of a paper and discussion before the Cleveland Inst. of Engrs. Investigates some of the conditions under which relative rates of corrosion take place, suggesting protective methods. 2500 w. Ir & Coal Trds Rev—March 5, 1909. No. 3179 A.

Corrosion of Iron and Steel. Edward Crowe. Abstract of paper before the Cleveland Inst. of Engrs. Considers some of the circumstances and conditions under which relative rates of corrosion take place. 1800 w. Engr, Lond—April 23, 1909. No. 4472 A.

The Corrosion of Iron. J. Newton Friend. Read before the Ir. & St. Inst. Discusses the various theories and considers the balance of evidence in favor of the acid theory. Refers to conclusions of Dr. William H. Walker. 1500 w. Engng—Oct. 15, 1909. No. 8936 A.

Rust. M. Thornton Murray. Read before the Staffordshire Iron & Steel Inst. Discusses theories of rust formation, influence of composition, protective measures, non-metallic rust preventives, etc. 5000 w. Ir & Coal Trds Rev—Nov. 13, 1908. No. 456 A.

The Corrosion of Metals Underground by Electrolysis. A. A. Kundson. Presents the present state of electrolytic action upon subsurface metals due to railway currents, illustrating the cause and effect. Ills. 4000 w. Jr Fr Inst—Aug., 1909. No. 7031 D.

Experiments on the Corrosion of Steel in Contact with Bronze in Sea-Water. Edward C. Sherman. A report of experiments made in connection with the work on the Charles River dam, at Boston, showing the protection afforded by a proper use of zinc. Also a study of the corrosion of submerged steel in contact with other metals. 1800 w. Eng News—March 18, 1909. No. 3242.

The Attack of Iron by Water and Aqueous Solutions (Ueber den Angriff des Eisens durch Wasser und wässrige Lösungen). E. Heyn and O. Bauer. A report from the Imperial German Testing Station. Ills. 6000 w. Stahl u Eisen—Oct. 28, 1908. No. 548 D.

Electrolytic Corrosion of the Bottom of Oil Tanks and of Other Structures. Adolphus A. Knudson. Read before the Am. Elec.-Chem. Soc. Describes cases of pronounced corrosion in oil tanks, discussing causes and remedies. Ills. 4000 w. Can Engr—Aug. 6, 1909. No. 6937.

See also Reinforced Concrete, under CIVIL ENGINEERING, MATERIALS OF

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Electrolysis

CONSTRUCTION; and Pipe Corrosion, under MECHANICAL ENGINEERING, HEATING AND COOLING.

Detinning.

The Detinning Industry. Briefly considers electrolytic detinning, chlorine detinning, and detinning of old cans. Ills. 2200 w. Ir & Coal Trds Rev—March 19, 1909. No. 3628 A.

The Detinning Industry in Italy (L'Industria della Distagnatura e le sue Condizioni in Italia). Mario Lombardi. Describes methods, plants, etc. 3500 w. Industria—June 13, 1909. No. 6554 D.

The Detinning of Tin-Plate Scrap and the Economics of the Process (Der Entzinnung der Weissblechabfälle und ihre wirtschaftliche Bedeutung). K. Goldschmidt. Describes various methods proposed and in use and discusses the economic importance of the detinning industry. Ills. 4400 w. Stahl u Eisen—Dec. 30, 1908. No. 1945 D.

Education.

See same title, under INDUSTRIAL ECONOMY.

Electric Furnaces.

The Laws of Electrode Losses in Electric Furnaces. Carl Hering. Gives the laws deduced by the writer, explaining the assumptions on which they are based, and giving proofs and examples. 7500 w. Elec-Chem & Met Ind—Oct., 1909. No. 8332 C.

Electrochemical Equivalents.

The Electrochemical Equivalent of Silver (L'Equivalent électrochimique de l'Argent). P. Janet, F. Laporte and P. de la Gorce. Report from the Laboratoire central d'Electricité. Describes apparatus and methods used in a new determination and gives results. Ills. 3500 w. Bul Soc Int d Elecns—Aug.-Oct., 1908. No. 1103 F.

Electro-Chemistry.

The Present State of Electro-Chemistry and Its Applications (Etat actuel de l'Electrochimie et de ses Applications). Octave Dony-Henault and Henri Gall. A general review of the applications of electro-chemistry. 11000 w. Rev d'Electrochim et d'Electrometal—Feb., 1909. No. 4211 F.

Electrolysis.

Electrolysis with Magnesium Kathodes (Ueber Elektrolyse mit Magnesiumkathoden). Dr. Fr. Schmidt. A report of

ELECTRICAL ENGINEERING

Electrolytic Assaying

experimental research. Ills. Serial. 1st part. 2000 w. *Elektrochem Zeitschr*—Sept., 1909. No. 8646 D.

Electrolytic Assaying.

Apparatus for the Rapid Electro-Analytical Separation of Metals. H. J. D. Sand. Abstract of a paper before the Faraday Soc. Illustrated description. 1200 w. *Elect'n, Lond*—Aug. 20, 1909. No. 7437 A.

The Laboratory for Electro-Analysis at Purdue University. Edward G. Mahin. Illustrated detailed description of a rather unique installation. 1200 w. *Elec-Chem & Met Ind*—Oct., 1909. No. 8331 C.

Electro-Metallurgy.

Some Recent Advances in Electro-Chemistry and Electro-Metallurgy. Saul Dushman. Discusses briefly the utilization of atmospheric nitrogen, electric smelting, advances in electro-metallurgy, etc. 2500 w. *Ap Sci*—Jan., 1909. No. 2095 C.

The Influence of Cheap Electricity on Electrolytic and Electrothermal Industries. E. A. Aschroft. Read before the Faraday Soc. An interesting paper discussing cost of electrical energy, per kilowatt per annum when produced by steam engines, gas engines, oil engines, and water power. 3500 w. *Elec Engr, Lond*—Jan. 1, 1909. No. 1691 A.

The Electric Furnace and Some of Its Applications. William Hoopes. Describes the electric furnace and its advantages, considering a number of applications. Ills. 4000 w. *Elec Jour*—April, 1909. No. 3951.

Electric and Fuel Furnaces. F. Louvri r. Considers the progress in the substitution of electrical energy, as a thermic agent, for the usual combustibles, coal, coke, petroleum, etc., and the causes. 2500 w. *Elec-Chem & Met Ind*—April, 1909. No. 3662 C.

Heat Conductance and Resistance of Composite Bodies. Carl Hering. Gives formulae for calculating the heat conducted through the walls of an electric furnace, with explanatory notes. 3500 w. *Elec-Chem & Met Ind*—Jan., 1909. No. 1675 C.

Furnace Electrode Losses. C. A. Hansen. Reports experiments made to determine the effect of electrode length on the electrode loss. 1200 w. *Elec-Chem & Met Ind*—Aug., 1909. No. 6828 C.

Furnace Electrode Losses. C. A. Hansen. Gives interesting experimental data concerning the consumption of elec-

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trodes by oxidation. 1800 w. *Elec-Chem & Met Ind*—Sept., 1909. No. 7592 C.

Furnace Electrode Losses. Carl Hering. Gives results of a theoretical investigation. 3500 w. *Elec-Chem & Met Ind*—Sept., 1909. No. 7595 C.

Heat Conductance Through Walls of Furnaces. Carl Hering. Read before the Am. Elec.-Chem. Soc. On the calculation of the heat conducted from the interior to the outside of an electric furnace through its walls. 4000 w. *Elec-Chem & Met Ind*—Dec., 1908. No. 760 C.

Silundum, a New Product of the Electric Furnace. F. B lling. An account of a product obtained when carbon is heated in a vapor of silicon. 2000 w. *Elec-Chem & Met Ind*—Jan., 1909. No. 1682 C.

Electric Furnace for the Production of Carbon Bisulphide. Explains some of the uses of bisulphide of carbon, and illustrates and describes the furnace used for its manufacture. 1600 w. *Elec Rev, Lond*—Dec. 25, 1908. No. 1520 A.

Reduction of Refractory Oxides, Production of Ferro-Alloys, and Formation of Carbides. Gives a summary of results obtained in recent researches at the Univ. of Manchester. 3000 w. *Elec-Chem & Met Ind*—March, 1909. No. 2989 C.

See also Refining, under MINING AND METALLURGY, COPPER; Electro-Metallurgy, under MINING AND METALLURGY, IRON AND STEEL; and Zinc Smelting, under MINING AND METALLURGY, LEAD AND ZINC.

Electro-Plating.

Modern Methods for the Electrodeposition of Zinc, Copper, Nickel and Brass. Louis Potthoff. Illustrates and describes automatic devices for the economical handling of material. 800 w. *Brass Wld*—Feb., 1909. No. 2724.

Making Up Small Electroplating Solutions, Particularly Those of Gold, by the Use of a Porous Cup. Illustrated description of a process suited for making up small solutions. 2000 w. *Brass Wld*—July, 1909. No. 6477.

The Conditions Which Determine the Composition of Electro-Deposited Alloys. Samuel Field. Abstract of paper read before the Faraday Soc. Investigates the conditions under which brass is deposited from a mixed solution of copper and zinc cyanides. 1500 w. *Elect'n, Lond*—July 30, 1909. No. 6980 A.

Coppering Iron or Steel Articles before Nickeling. Shows that a study of each case is necessary to prevent "spotting

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Galvanizing

out," and other troubles. 1600 w. Brass Wld—Oct., 1909. No. 8838.

A Simple Method of Recovering Gold from Cyanide and Yellow Prussiate Plating Solutions. Describes a method in which the gold is precipitated on zinc shavings. 1400 w. Brass Wld—Sept., 1909. No. 7879.

Automatic Electroplating by Means of the Broderick Machine. Illustrated description of this plating machine and its operation. 1000 w. Brass Wld—Feb., 1909. No. 2722.

Warner's Method of Electroplating Flowers. Illustrated detailed description. 2500 w. Brass Wld—Dec., 1908. No. 1323.

Galvanizing.

Researches on Electro-Galvanizing (Einige Versuche über galvanische Verzinkung). Carl Richter. Gives results of tests made under various conditions. 2000 w. Elektrochem Zeitschr—Dec., 1908. No. 1946 D.

Nitrates.

The Schönherr Process for the Manufacture of Nitric Acid and Nitrates from the Atmosphere (La Fabrication de l'Acide azotique et des Azotates au Moyen de l'Azote atmosphérique, Procédé Schönherr). E. Lemairs. Describes the process and plant of the Badische Anilin- und Soda-Fabrik. Ills. 4800 w. Génie Civil—July 24, 1909. No. 7233 D.

Nitric Acid.

The Electric Discharge and the Production of Nitric Acid. William Cramp and Bertram Hoyle. Summarizes methods employed for the fixation of nitrogen, describing an experimental apparatus and the results obtained with it, etc. Ills. 13000 w. Inst of Elec Engrs—Dec., 1908. No. 1389 N.

Nitrogen.

The Utilization of Atmospheric Nitrogen. A. Bernthsen. Discusses methods of fixing atmospheric nitrogen, and the utility of the product. 5000 w. Eng & Min Jour—Oct. 16, 1909. No. 8721.

The Fixation of Atmospheric Nitrogen. Sam Eyde. Illustrated description of the Birkeland-Eyde process. 3500 w. Sci Am Sup—July 3, 1909. No. 6091.

The Manufacture of Nitrates from the Atmosphere by the Electric Arc—Birkeland-Eyde Process. Sam Eyde. Describes power station and plant for working this process at Notodden. Ills. 5200 w. Jour Soc Arts—May 28, 1909. No. 5406 A.

ELECTRO-CHEMISTRY

Ozone

Utilization of Atmospheric Nitrogen Particularly for the Manufacture of Air-Saltpetre. Dr. A. Beruthsen. Abstract of a paper read at the Int. Cong. of Am. Chem. Deals especially with the application and methods. 3000 w. Elect'n, Lond—June 11, 1909. No. 5652 A.

The Process of the Badische Company for the Fixation of Atmospheric Nitrogen. Abstract of a paper before the Berlin Electrical Society by Dr. Schoenherr, describing the special type of electrical furnace and methods now employed. Ills. 2700 w. Elec-Chem & Met Ind—June, 1909. No. 5344 C.

The Innsbruck Plant for Nitric Acid from Air. Brief illustrated description of a process for the fixation of atmospheric nitrogen working in the Tyrol. The inventors are H. & G. Pauling. 1000 w. Elec-Chem & Met Ind—Oct., 1909. No. 8329 C.

The Manufacture of Saltpetre from the Air by the Process of the Badische Anilin & Soda Fabrik. A general description of the process. 2000 w. Elec Rev, N. Y.—June 26, 1909. No. 6017.

Atmospheric Nitric Acid and Nitrates. Reviews briefly the attempts made for the commercial fixation of atmospheric nitrogen, specially describing the system of Mr. Moscicki. 1600 w. Elec Engr, Lond—Jan. 29, 1909. No. 2344 A.

The Fixation of Atmospheric Nitrogen by Electricity (La Nitrification de l'Air par Voie électrique). M. Dony. A general review of the various methods and the state of the industry. Ills. 6000 w. Soc Belge d'Elecn—March, 1909. No. 4206 E.

The Fixation of Atmospheric Nitrogen (Der gegenwärtige Stand der Stickstofffrage). L. Max Wohlgemuth. A brief review of the present state of the industry, the products, etc. 2700 w. Stahl u Eisen—May 19, 1909. No. 5749 D.

Ozone.

The Thermal Production of Ozone. Arthur W. Ewell. Reviews the experimental work in this field. 2000 w. Elec-Chem & Met Ind—Jan., 1909. No. 1681 C.

The Production and Uses of Ozone (Sur la Production et les Usages de l'Ozone). Léon Gerard. Reviews the methods of production by electricity, its use in water purification, etc. Bibliography. Ills. 17000 w. Soc Belge d'Elecn—Aug., 1909. No. 7901 E.

Progress in the Electric Production of Ozone (Neuerungen auf dem Gebiete der elektrischen Ozonerzeugung). Oscar

ELECTRICAL ENGINEERING

Review of 1908

ELECTRO-PHYSICS

Cells

Kausch. A digest of recent patents in this field. Ills. Serial, 1st part. 1000 w. *Elektrochem Zeitschr*—July, 1909. No. 7256 D.

Review of 1908.

Electrochemistry in 1908. F. Mollwo Perkin. A review of progress in the electrochemical industries. 5000 w. *Elect'n*, Lond—March 26, 1909. No. 3780 A.

Valve Electrodes.

Tungsten as "Valve" Electrode. L. H. Walter. A brief account of experiments made. 2000 w. *Elec Engr*, Lond—Sept. 17, 1909. No. 8109 A.

The Metal Tungsten as "Valve" Electrode. L. H. Walter. Shows that the metal tungsten behaves as a valve electrode in a large number of electrolytes. 1500 w. *Elect'n*, Lond—Aug. 13, 1909. 8486 A.

Water Electrolysis.

A New Electrolyzer. Describes a new type of Electrolyzer designed to furnish oxygen and hydrogen at high pressure for industrial work and capable of being used with either high or low current. Ills. 3000 w. *Sci Am Sup*—June 5, 1909. No. 5314.

ELECTRO-PHYSICS

Alternating Currents.

Non-Harmonic Alternating Currents. Dr. Benjamin F. Bailey. Calls attention to features of complex harmonic e. m. f. s. and currents. 2000 w. *Elec Wld*—Nov. 28, 1908. No. 634.

Even Harmonics in Alternating-Current Circuits. Charles P. Steinmetz. Shows that it is incorrect to assume that even harmonics are never present, citing examples. 700 w. *Elec Wld*—March 25, 1909. No. 3513.

Even Harmonics in Alternating-Current Circuits. John B. Taylor. A discussion of usual and special conditions giving rise to even harmonics in alternating-current circuits. Ills. 1500 w. *Pro Am Inst of Elec Engrs*—July, 1909. No. 6496 F.

Polyphase Magnetomotive Forces. J. D. Nies. Derives rules by means of which any step curve can be resolved into sine components, a fundamental and higher harmonics. 3500 w. *Elec Wld*—Aug. 26, 1909. No. 7352.

The Production of Small Variable Frequency Alternating Currents Suitable for Telephonic and Other Measurements. B. S. Cohen. Abstract of a paper read before the Physical Soc. Describes various methods of producing such currents, including a new method. 1200 w. *Elect'n*, Lond—Dec. 4, 1908. No. 1010 A.

The Dielectric Strength of Compressed Air. E. A. Watson. Experimental investigations to determine the manner in which the dielectric strength of air changes when compressed to pressures higher than atmospheric. 4500 w. *Inst of Elec Engrs*—March, 1909. No. 3283 N.

Arcs.

On the Electric Arc Between Metallic Electrodes. W. G. Cady and G. W. Vinal. A study of the theory and production of oscillations between arc and glow. 4000 w. *Am Jour of Sci*—Aug., 1909. Serial, 1st part. No. 7018 D.

The Relighting of the Carbon Arc. J. A. Pollock, E. M. Wellisch and A. B. B. Ranclaud. Abstract from *Phil. Mag.* Investigates the relation between the potential difference across the carbons and the maximum time of interruption of the circuit within which the arc will re-form. 1500 w. *Elect'n*, Lond—Oct. 1, 1909. No. 7314 A.

The Rotation of the Electric Arc in a Radial Magnetic Field. J. Nicol. Abstract of a paper read before the Roy. Soc. Experiments showing the speed of the arc to be independent of the arc length, to be proportional to the magnetic field strength, and to increase linearly with the current. 1000 w. *Elect'n*, Lond—Sept. 3, 1909. No. 7733 A.

Atomic Theory.

Prof. E. Rutherford's Address to Section A of the British Association. (Abstract.) Considers the present position of the atomic theory in physical science, and methods devised to determine the values of fundamental atomic magnitudes. 4500 w. *Elect'n*, Lond—Aug. 27, 1909. No. 7647 A.

Cells.

Experiments on the Current and Energy Efficiencies of the Finlay Electrolytic Alkali-Chlorine Cell. F. G. Donnan, J. T. Barker, and B. P. Hill. Abstract of a paper read before the Faraday Soc. De-

ELECTRICAL ENGINEERING

Circuit Closing

scribes the main features and gives particulars of efficiency tests. Ills. 2000 w. Elect'n, Lond—April 30, 1909. No. 4602 A.

Circuit Closing.

Circuit-Closing Phenomena in Capacity-Free Circuits (Ueber Einschaltvorgänge in kapazitätsfreien Stromkreisen). A. Schwaiger. An exhaustive mathematical discussion, with results of tests. Ills. Serial, 1st part. 5500 w. Elektrotech u Maschinenbau—July 4, 1909. No. 7462 D.

Condensers.

The Effect of an Air-Blast Upon the Spark Discharge of a Condenser Charged by an Induction Coil or Transformer. J. A. Fleming and H. W. Richardson. Abstract of a paper before the Phys. Soc. The discharge current is shown to be more regular and the resonance more accurately delineated. 1500 w. Elect'n, Lond—May 14, 1909. No. 4947 A.

Conductivity.

Conductivity and the Valuation of Electric Conductors. E. F. Northrup. A statement of accepted definitions of conductivity and the necessary relations which follow, with a brief account of how conductivity may be measured. 6000 w. Elec-Chem & Met Ind—May, 1909. No. 4506 C.

The Conduction of Electricity. Prof. J. Koenigsberger's views and other researches, explanatory of the ionic theory. 2500 w. Sci Am Sup—Aug. 28, 1909. No. 7380.

Some Peculiarities of Electrical Conductivity Exhibited by Powders and a Few Solid Substances. R. H. Goddard. Abstract from *Phys. Rev.* Investigates phenomena of conduction and offers a theory in explanation. 3000 w. Elect'n, Lond—Aug. 13, 1909. No. 7315 A.

The Effect of Tension on Thermal and Electrical Conductivity. N. F. Smith. Abstract from *Phys. Rev.* Gives results showing that thermal conductivity of bars of iron, steel, copper, brass, etc.; increased when a moderate tension was applied, whilst the electrical conductivity diminished. 1500 w. Elect'n, Lond—Sept. 3, 1909. No. 7734 A.

Currents.

Direct and Alternating Currents. S. A. Fletcher. The difference between the two simply explained. 2200 w. Sci Am Sup—Dec. 26, 1908. No. 1295.

Current Surge.

Current Surge in Closing an Inductive Circuit. J. E. Fries. Discusses the causes and factors of this phenomenon. 2000 w. Elec Age—Nov., 1908. No. 880.

ELECTRO-PHYSICS

Electromagnets

Dielectric Strength.

See same title, under MEASUREMENT.

Electric Waves.

Distorted Waves and Their Analysis by a Simple Method. Henry Hermann. Outlines the method and analysis of typical waves. 5000 w. Elec Rev, N Y—July 17, 1909. No. 6394.

Experimental Method for the Analysis of E. M. F. Waves. P. G. Agnew. Describes experiments made to determine whether it is possible to get an approximate value of the first and second harmonics present in an e. m. f. wave by means of ordinary portable instruments and calibrated condensers. 2500 w. Elec. Wld—July 15, 1909. No. 6336.

The Coefficient of Reflection of Electrical Waves at a Transition Point. Louis Cohen. Develops an expression for the ratios of the reflected and transmitted waves to the incoming wave at a transition point. 900 w. Bul Bureau of Stand—May, 1909. No. 6373 N.

Graphical Computation of Fourier's Constants for Alternating-Current Waves. Charles S. Slichter. Describes a method of analysis requiring the wave form to be plotted on specially prepared co-ordinate paper, once for each harmonic, and the curve to be measured by planimeter. Also editorial note. 1500 w. Elec Wld—July 15, 1909. No. 6338.

Electromagnets.

The Calculation of Electromagnets. M. Kennett. Gives some simple methods of calculating the size of the iron cores, and the winding of their exciting coils. Ills. 4000 w. Sci Am Sup—Aug. 7, 1909. No. 6960.

The Design of the Marcel Deprez Electromagnet. Charles R. Underhill. Discusses the relations between the solenoid and plunger. 1200 w. Elec Rev, N Y—Aug. 7, 1909. No. 6938.

The Weiss Laboratory Electromagnet. M. P. Misslin. Illustrated description of the laboratory magnet designed by Prof. P. Weiss. 1500 w. Elec Wld—Aug. 26, 1909. No. 7353.

Test of Electromagnets. C. P. Nachod. Brief account of tests made to determine the most suitable form of magnets of given dimensions. Ills. 400 w. Elec Wld—Sept. 30, 1909. No. 8248.

The Effect of Damping Windings on Direct-Current Magnet (Ueber die Wirkungsweise von Dämpferwicklungen auf Gleichstrommagneten). Karl Willy Wagner. Mathematical. Ills. Serial, 1st part.

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Electrons

4000 w. *Elektrotech u Maschinenbau*—Aug. 29, 1909. No. 7996 D.

Electrons.

Theory of Electrons. Sir Oliver Lodge. An explanation. 2000 w. *Sci Am Sup*—Jan. 2, 1909. No. 1431.

Recent Electrical Theory. J. Franklin Meyer. Reviews the attempts to formulate an electrical theory and explains the electron theory. 3000 w. *Engr, Pa*—Dec., 1908. No. 2011 D.

What Is the Electron Theory? Prof. L. Graetz, in *Umschau*. A simple and clear explanation. 2500 w. *Sci Am Sup*—Feb. 13, 1909. No. 2402.

The Discharge of Electricity from Glowing Bodies. Prof. E. Rutherford. Abstract of a lecture before the Manchester Sec. of Inst. of Elec. Engrs. A study of the effect of high temperatures in producing ionization. 1000 w. *Elect'n, Lond*—Dec. 11, 1908. No. 1211 A.

The Constitution of Matter and of the Aether (Ueber die Konstitution der Materie und des Weltäthers). H. Strache. A brief statement of recent theories. Ills. 4000 w. *Zeitschr d Oest Ing u Arch Ver*—March 19, 1909. No. 4279 D.

The Electron Theory of Currents and their Properties (Théorie électronique des Courants et de leurs Propriétés). H. Pellat. A general explanation of the electron theory. 5000 w. *Bul Soc Int des Elecns*—May, 1909. No. 5718 F.

Flame.

The Electrical Properties of Flame. Harold Albert Wilson. Read before the Roy. Inst. of Gt. Britain. A study of the conductivity of flame. 2000 w. *Elec Engr, Lond*—Aug. 6, 1909. No. 7087 A.

Effect of a Magnetic Field on the Electrical Conductivity of Flame. Prof. H. A. Wilson. An account of some measurements of the change in the conductivity of a Bunsen flame produced by a magnetic field. 900 w. *Elect'n, Lond*—Sept. 24, 1909. No. 8347 A.

Heat Convection.

The Convection of Heat from Small Copper Wires. A. E. Kennelly, C. A. Wright and J. S. Van Bylevelt. Describes a research made on the convective loss of heat from small copper wires, of less than 0.7 mm. or 27.5 mils diameter, presenting quantitative results. Ills. 5500 w. *Pro Am Inst of Elec Engrs*—July 1909. No. 6483 F.

Heating.

The Heating of Electrical Resistances by Variable Currents (Die Ermittlung

ELECTRO-PHYSICS

Magnetic Alloys

der Uebertemperaturen elektrischer Widerstände bei veränderlicher Strombelastung). C. Richter. A mathematical discussion of the effect of variability of current on the ordinary laws of heating. Ills. 3500 w. *Elektrotech u Maschinenbau*—March 21, 1909. No. 4288 D.

Hertzian Waves.

Hertz's Investigations on Electrical Waves (Ueber die Hertz'schen Versuche mit elektrischen Wellen). L. Zehnder. Discusses the investigations and the theoretical and practical value of the results. Ills. 5000 w. *Elektrotech Zeitschr*—Oct. 15, 1908. No. 612 B.

History.

The History of Electrical Theories. P. Gruner. Abstract translation of a paper read before the Keplerbund at Frankfurt. Traces the changes which discovery has wrought. 2000 w. *Sci Am Sup*—Nov. 28, 1908. No. 474.

Hysteresis.

Dependence of Magnetic Hysteresis Upon Wave Form. Morton G. Lloyd. Describes investigations made, the apparatus used, and states the conclusions. 7000 w. *Bul Bureau of Stand*—Feb., 1909. No. 3286 N.

Differential Ballistic Methods of Measuring Hysteresis Losses. R. Beattie and P. M. Elton. Describes a method that is quick in operation and has the advantage that it refers to short test pieces. 3000 w. *Elect'n, Lond*—June 4, 1909. Serial. 1st part. No. 5518 A.

Induction.

The Induction Law (Des Induktionsgesetz). Fritz Emde. An extensive theoretical discussion. Ills. Serial. 1st part. 3200 w. *Elektrotech u Maschinenbau*. Nov. 15, 1908. No. 1186 D.

The Induction Law (Zum Induktionsgesetz). Fritz Emde. Discusses special cases of its application. Ills. 3500 w. *Elektrotech u Maschinenbau*—Aug. 22, 1909. No. 7994 D.

Some New Relations between the Factors which Serve to Express the Law of Electro-Magnetic Induction (Quelques nouvelles Relations entre les Facteurs qui Servent à Exprimer la Loi de l'Induction électro-magnétique). A. Mégroz. Mathematical. Ills. 3000 w. *Bul Tech d l Suisse Romande*—Aug. 10, 1909. No. 7930 D.

Magnetic Alloys.

Experiments with Heusler's Magnetic Alloy. J. G. Gray. Abstract of paper read before the Roy. Soc. of Edinburgh.

ELECTRICAL ENGINEERING

Magnetic Properties

Describes investigations of the magnetic properties at different temperatures. 1200 w. *Elect'n*, Lond—Dec. 25, 1908. No. 1525 A.

Magnetic Properties.

Researches on the Magnetic Properties of a Series of Carbon Tungsten Steels. T. Swinden. Read before the Leeds Sec. of the Inst. of Elec. Engrs. Describes a continuation of investigation into the properties of a series of constant-tungsten increasing-carbon steels. 2000 w. *Elect'n*, Lond—March 12, 1909. No. 3404 A.

Silicon and its Influence on the Electric and Magnetic Properties of Iron. Discussion of various researches made with silicon and silicon alloys. 2600 w. *Engng*—May 28, 1909. No. 5262 A.

Influence of Arsenic and of Tin Upon the Magnetic Properties of Iron. Charles F. Burgess and James Aston. Submits results of investigations. 2200 w. *Elect'Chem & Met Ind*—Sept., 1909. No. 7596 C.

See also Bronzes, under MECHANICAL ENGINEERING, MATERIALS OF CONSTRUCTION.

Magnetic Storms.

The Magnetic Storm of September 25th. An account of the storm and the interruption it caused to telegraphic communication. 2200 w. *Elect'n*, Lond—Oct. 8, 1909. No. 8868 A.

Magnets.

On the Self-Demagnetizing Factor of Bar Magnets. Silvanus P. Thompson. Abstract of a paper read before the Phys. Soc. Defines the term and reports experimental investigations. 1500 w. *Elect'n*, Lond—Sept. 10, 1909. No. 7861 A.

Mechanical Equivalent.

The Absolute Value of the Mechanical Equivalent of Heat, in Terms of the International Electrical Units. H. T. Barnes. Abstract of a paper before the Roy. Soc. Gives results of recent comparisons. 900 w. *Elect'n*, Lond—Aug. 20, 1909. No. 7438 A.

Oscillations.

The Coefficient of Reflection of Electrical Waves at a Transition Point. Louis Cohen. Mathematical development of expressions for the ratios of the reflected and transmitted waves to the incoming waves at a transition point. 800 w. *Elec Wld*—March 11, 1909. No. 3085.

Complex Calculation of Oscillation Problems (Die komplexe Rechnung bei Schwingungen). Fritz Emde. A discus-

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sion of the use of complex quantities in the treatment of the theory of oscillations. Ills. Serial. 1st part. 3000 w. *Elektrotech u Maschinenbau*—Jan. 24, 1909. No. 2830 D.

Permeability,

On the Permeabilities and the Reluctivities, for Very Wide Ranges of Excitation, of Normal Specimens of Compressed Steel, Bessemer Steel and Norway Iron Rods. B. Osgood Peirce. Describes a long series of determinations over a wide range of excitation, and considers especially a method of measurement in a massive yoke. Ills. 3000 w. *Am Jour of Sci*—April, 1909. No. 3803 D.

Radiation.

Selective Radiation from Various Solids. W. W. Coblentz. A qualitative proof of Kirchhoff's law of proportionality between emission and absorption. An examination of the emission spectra of electrical insulators. 7500 w. *Bul Bureau of Stand*—Nov., 1908. No. 1344 N.

The Luminous Equivalent of Radiation. P. G. Nutting. A discussion of the problem and of the functions involved, aiming to establish a precise relation between light and radiation. 11000 w. *Bul Bureau of Stand*—Nov., 1908. No. 1348 N.

Radio-Activity.

Progress in Electricity. Prof. Sir J. J. Thomson. Presidential address before the British Assn. for the Adv. of Science. An account of recent developments of physics, and the new conceptions of physical processes. 3000 w. *Elec Engr*, Lond—Aug. 27, 1909. Serial. 1st part. No. 7644 A.

Studies of Electricity and Matter. Sir J. J. Thomson. Abstracted from the presidential address to the British Assn. for the Adv. of Science. A resumé of recent investigation. 4500 w. *Sci Am Sup*—Sept. 4, 1909. Serial. 1st part. No. 7562.

The Address of the President of the British Association. Editorial review of the address of Sir Joseph J. Thomson, dealing principally with radio-activity and allied phenomena. 3000 w. *Engng*—Aug. 27, 1909. No. 7655 A.

Rays of Positive Electricity. Sir J. J. Thomson. Delivered at the Royal Inst. Describes a new investigation of Goldstein's "canal rays." Ills. 5000 w. *Sci Am Sup*—Jan. 2, 1909. No. 1430.

Radio-Active Elements. A. T. Cameron. Information concerning their number and their properties. 3000 w. *Sci Am Sup*—Dec. 19, 1908. No. 1234.

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Radio-Activity

Radium Emanation. F. H. Mason. Remarks on the experiments carried out jointly by Sir William Ramsey and Robert Whytlaw Gray to determine the atomic weight of "radium emanation." 1200 w. *Min & Sci Pr*—Sept. 25, 1909. No. 8227.

Radioactive Substances (Ueber radioaktive Substanzen). Stephan Meyer. A review of present knowledge of radioactivity, particularly the recent discoveries. Ills. Serial. 1st part. 2000 w. *Zeitschr d Oest Ing u Arch Ver*—Jan. 8, 1909. No. 2813 D.

Radioactive Transformations and Transmutations (Transformations radioactives et Transmutations). Jacques Danne. A review of recent advances and present knowledge. Ills. Serial. 1st part. 4800 w. *Génie Civil*—Jan. 2, 1909. No. 2636 D.

Radioactivity in Geology and in the Atmosphere (La Radioactivité en Géologie et dans l'Atmosphère). M. P. Beson. Discusses the recent progress of knowledge as the significance of radioactivity in geology and meteorology. Ills. 6800 w. *Mem Soc Ing Civils de France*—March, 1909. No. 5702 G.

Resistance.

The Variation of Manganin Resistances with Atmospheric Humidity. F. E. Smith, in the *Phil. Mag.* Describes tests carried out at the Nat. Phys. Laboratory, showing that coils, coated with a varnish which does not absorb moisture, have an advantage over shellac-coated coils. 1700 w. *Elect'n, Lond*—Nov. 20, 1908. No. 733 A.

Röntgen Rays.

An Apparatus for Generating High-Tension Direct Current for the Production of Röntgen Rays (Ein Apparat zur

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Accumulators

Erzeugung hochgespannten Gleichstroms für die Röntgentechnik). Martin Hochstädter. Illustrated description. Serial. 1st part. 3200 w. *Elektrotech u Maschinenbau*—June 13, 1909. No. 6716 D.

Self-Induction.

A Graphical Study of Self-Induction. F. P. McDermott, Jr. Discusses the application of a graphic method to problems connected with the rise of current in a circuit possessing resistance and inductance under the application of a steady e. m. f. 1500 w. *Elec Wld*—May 20, 1909. No. 5042.

Skin Effect.

The Increase in Resistance through the Skin Effect (Ueber die Widerstandszunahme durch Skinwirkung). Dr. F. Rusch. Mathematical. Ills. 2500 w. *Elektrotech Zeitschr*—Nov. 5, 1908. No. 1199 B.

The Superficial Localization of Currents and Variable Fluxes (Sur la Localisation superficielle des Courants et Flux variables). P. Boucherot. A simplified mathematical discussion. Ills. 3800 w. *Bul Soc Int des Elecns*—Nov., 1908. No. 1904 F.

Spark Gaps.

Note on the Electrical Resistance of Spark Gaps. R. A. Houstun. Abstract of paper read before the Roy. Soc. of Edinburgh. Describes the effect of changing the material of the electrode. 1000 w. *Elect'n, Lond*—Dec. 25, 1908. No. 1526 A.

Waves.

The Resolution of Periodic Curves into their Harmonic Waves (Ueber die Zerlegung periodischer Kurven in ihre harmonischen Wellen). J. Fischer Hinnen. Mathematical. Ills. 4500 w. *Elektrotech u Maschinenbau*—April 11, 1909. No. 5067 D.

GENERATING STATIONS

Accumulators.

Storage Batteries. W. B. Kouwenhoven. Suggestions for their care and operation. Ills. 2000 w. *Ry & Loc Engng*—Nov., 1908. No. 10 C.

The Storage Battery. A. Wohlgenuth. Explains both the Planté and Faure types, and matters relating to their use. Ills. 1500 w. *Power*—May 25, 1909. No. 4979.

The Installation and Care of Storage Batteries. Omer F. Dubruiel. Directions for installing, care, charging, etc. 3000 w. *Elec Wld*—May 6, 1909. No. 5034.

Automatic Load Regulation on Traction Systems—An Example of Successful Storage-Battery Engineering. F. W. Laas. Paper read before Iowa Electrical and Railway Association in which economy of the storage battery is shown. Ills. 2700 w. *Elec Rev, N Y*—June 5, 1909. No. 5422.

The Theoretical Calculation of the Battery Capacity Required for a Given Load. Dr. W. Lulofs. Aims to show that the Peukert formula holds good for English makes, and to calculate the respective

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values of the constants n and a . 1500 w. *Elect'n, Lond*—Jan. 1, 1909. No. 1698 A.

Storage Batteries in Mining Service. George A. Iler. Illustrates and describes a plant installed at Prudence, W. Va. 1000 w. *Elec Wld*—Jan. 2, 1909. No. 1472.

Accumulators for Peak Loads. A. M. Taylor. Considers the comparative costs and working expenses of steam plant and accumulators, showing the decided advantage of the latter. 2500 w. *Elect'n, Lond*—Dec. 4, 1908. No. 1009 A.

The Application of Storage Batteries to the Regulation of the Alternating-Current Load at the Plant of the Indiana Steel Company, Gary, Indiana. J. Lester Woodbridge. A brief general description, giving an account of the actual commercial operation. Ills. 3000 w. *Pro Am Inst of Elec Engrs*—July, 1909. No. 6493 F.

The Operation and Maintenance of Storage Batteries. T. P. Strickland. Describes the system in use at the Sydney, N. S. W., Tramway Department. 3000 w. *Aust Min Stand*—Nov. 18, 1908. Serial. 1st part. No. 1097 B.

Lead Accumulator Electrolyte. A. Henrick Jackson. Read before the Elec. Assn. of Vic. Considers the nature, density and amount of the electrolyte, its function, purity, etc. 2500 w. *Aust Min Stand*—Nov. 11, 1908. No. 1088 B.

Researches on a Light Accumulator (*Recherches sur un Accumulateur léger*). Robert Goldschmidt. Describes researches on a zinc-potassium carbonate-nickel oxide cell. 4500 w. *Soc Belge d'Electns*—Oct., 1908. No. 508 E.

The Requirements and Installation of Accumulator Rooms (*Ueber die Eigenschaften und die Herstellung von Akkumulatoren-räumen*). Brief general discussion. 2500 w. *Elektrochem Zeitschr*—Aug., 1909. No. 7948 D.

See also Rotary Converters, under TRANSMISSION; and Electric Power, under MARINE AND NAVAL ENGINEERING; and Electric, under MECHANICAL ENGINEERING, AUTOMOBILES.

Austria.

Details of Austrian Electrical Plants Built or Extended in 1906 and 1907 (*Statistik der österreichischen Elektrizitätswerke welche im Jahre 1906 und 1907 erbaut und erweitert wurden*). Tables. 4000 w. *Elektrotech u Maschinenbau*—Oct. 25, 1908. No. 596 D.

GENERATING STATIONS

Centralization.

Centralization of Power Supply. Louis A. Ferguson. Presidential address on the advantages of centralization. 2200 w. *Pro Am Inst of Elec Engrs*—Aug., 1909. No. 7055 F.

The Supply of Electric Current to Other Towns from a Centrally Located Station. I—O. H. Hutchings. II—Claude Smith. Two papers read before the Ohio Elec. Lgt. Assn. 2500 w. *Elec Rev, N Y*—Aug. 7, 1909. No. 6940.

Central Stations.

Modern Power Station Design. H. de B. Parsons. The article is confined to steam-driven plants, and considers the essentials of commercial and operative success. 5000 w. *Cassier's Mag*—Aug., 1909. No. 7034 B.

Features of Recent Electric Railway Power Station Design. An illustrated comparison of stations built in the last six years, showing general tendencies of arrangement and equipment. 2000 w. *Elec Ry Jour*—March 27, 1909. No. 3508.

The Rating and Cost of Steam Electric Generating Stations. H. M. Hobart. An investigation. 1200 w. *Elec Rev, Lond*—May 7, 1909. Serial. 1st part. No. 4667 A.

Economies of Medium-Sized Power Stations. A. J. J. Pfeiffer. A study of comparisons between steam, gas, and oil engines. Ills. 4000 w. *Inst of Elec Engrs*—May, 1909. No. 4943 N.

The Supply of Electrical Energy for Power Purposes in Connection with Traction Supply Systems. Arthur Imbery. Explains methods of feeding traction circuits, and of supplying consumers, and the precautions necessary to comply with the Board of Trade regulations. Diagrams. 2200 w. *Elec Rev, Lond*—April 23, 1909. Serial. 1st part. No. 4447 A.

Central Station Design and Distribution. E. P. Hollingdale. Read before the Elec. Assn. of N. S. W. Discusses details of importance in this connection. 2500 w. *Aust Min Stand*—May 12, 1909. Serial. 1st part. No. 5824 B.

The Design and Requirements of Electric Power Works. Horace Boot. Paper read before (British) Institution of Mechanical Engineers. Discusses site, requirements, destructors, engines, etc. Ills. 3200 w. *Surveyor*—May 28, 1909. No. 5450 A.

The Distribution Department. H. F. J. Thompson. Considers the staff needed to secure efficient and economical working, the duties, etc. 2500 w. *Elec Rev, Lond*—June 11, 1909. No. 5648 A.

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The Relative Advantages of Reciprocating Engines and Turbines for Traction Generating Stations. G. Rizzo. Abstract of a report on replies to questions sent out, discussing the boiler-house problem, and considering the heat cycles produced by both reciprocating engines and turbines. 3000 w. *Elect'n, Lond*—June 11, 1909. No. 5649 A.

General Considerations in the Design of Large Steam Central Stations (Notes sur les grandes Usines centrales à Vapeur au Point de Vue des Conditions generales de leur Etablissement). M. G. Chevrier. Discusses their location, layout, and design and arrangement of the steam and electrical equipment. 13000 w. *Mem Soc Ing Civ de France*—June, 1909. No. 7903 G.

Central Stations in Towns of Less Than 4000 Population. James S. Knowlson. Abstract of a paper read before the Nat Elec Lgt Assn. Considers conditions essential to success and satisfactory service. Ills. 3500 w. *Elec Rev, N. Y.*—July 24, 1909. No. 6653.

Rise of Generator Capacity. Alton D. Adams. A record of the changes of generators in the electrical supply system of a large city, with a diagram showing the relation of time to their types, capacities and voltages. 1600 w. *Elec Rev, N Y.*—Sept. 25, 1909. No. 8075.

The Efficiency of Electric Power Stations. Remarks on the losses in electric generating stations, and the possibility of securing more economical results. 1200 w. *Engr, Lond*—Aug. 27, 1909. No. 7660 A.

An Investigation of the Heat-Losses in an Electric Power-Station. Frank Huntington Corson. Describes a test made at the Blackburn generating-stations. Also abstract of discussion. Ills. 20500 w. *Inst of Civ Engrs*—No. 3765. No. 8162 N.

Heat-Losses in an Electric Power Station. Abstract of a paper by F. H. Corson, before the Inst. of Civ. Engrs. A report of trials. 1200 w. *Engng*—Jan. 1, 1909. No. 1706 A.

Electricity Supply in the Tropics. An account of some of the problems encountered in the erection and operation of a plant. 1800 w. *Elec Rev, Lond*—Jan. 1, 1909. No. 1696 A.

The Use of Large Gas Engines for Generating Electric Power. Leonard Andrews and Reginald Porter. Estimates the respective capital costs of a steam turbine and a gas engine central station for the same load, and shows what the running costs would be. Ills. 12000 w. *Inst of Elec Engrs*—Feb. 11, 1909. No. 2579 N.

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A 60-Cycle Gas-Driven Power Station. J. R. Bibbins. A report of operating results at the plant of the Union Switch & Signal Co. Ills. 3300 w. *Elec Jour*—Feb., 1909. No. 2738.

Operating Results from a Sixty-Cycle Gas-Driven Power Station. J. R. Bibbins. Gives actual experience and results at the Swissvale, Pa., plant. 4500 w. *Elec Rev, N Y*—Feb. 13, 1909. No. 2463.

Electrical Engineers and Gas Power. Philip W. Robson. Considers the application of gas engines to moderate-size generating stations. 2500 w. *Elec Rev, Lond*—March 26, 1909. No. 3778 A.

Producer Gas-Engine Central Station Plant. Illustrates and describes features of interest in the system at Keene, N. H. 2500 w. *Elec Wld*—Nov. 14, 1908. No. 225.

Gas-Producer Central Station at Harvard, Ill. Brief illustrated description. 1200 w. *Elec Wld*—April 15, 1909. No. 3943.

Producer Gas-Engine Station at Hoopston, Ill. Describes a 280-hp gas engine supplied by two producers of the Munzel type driving a 200 k. w. 60 cycle, 2300 volt alternator. Ills. 4000 w. *Elec Wld*—June 3, 1909. No. 5270.

A South American Gas-Engine-Driven Central Station. J. P. Stone. Illustrates description of a gas power plant at Dolores, Argentine Republic. 2500 w. *Elec Wld*—Sept. 9, 1909. No. 7619.

Building and Boiler Plant of Waterside Station No. 2 of the New York Edison Company. Illustrated detailed description of the building and its equipment, with a comparison with Waterside Station No. 1. 4000 w. *Elec Wld*—March 4, 1909. No. 2991.

Main and Auxiliary Steam Equipment in Waterside Station No. 2 of the New York Edison Company. Illustrated description of the feed-water system, high-pressure steam piping, exhaust and drip piping, and oiling system. 3500 w. *Elec Wld*—March 11, 1909. No. 3084.

Low-Voltage Equipment and Control in Waterside Station No. 2 of the New York Edison Company. Illustrated detailed description. 2500 w. *Elec Wld*—April 8, 1909. No. 4430.

Power Improvements of the Coney Island & Brooklyn Railroad Company. Illustrated detailed description of the new power system put in operation Nov. 1, 1908. 3500 w. *Elec Ry Jour*—Aug. 14, 1909. No. 7047.

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Power Plant Extensions of the Boston Elevated Railway Company. Illustrates and describes the enlargement of the power plants and reconstruction work. 2500 w. Elec Wld—Feb. 18, 1909. No. 2517.

A New Lighting Station for Brockton. E. T. Reed. Illustrated description of a modern alternating-current turbine plant. 2500 w. Power—Feb. 16, 1909. No. 2499.

Recent Central Station Developments at Hartford, Conn. Describes the plants and their equipment, discussing recent improvements. Ills. 3000 w. Elec Wld—Nov. 28, 1908. No. 633.

System of the Lockport Light, Heat and Power Company. Outlines the history and gives illustrated description of stations. 2500 w. Elec Wld—May 6, 1909. No. 5029.

Station No. 3 of the Rochester Railway & Light Company. Illustrated description of the largest steam generating station of this company. 3500 w. Elec Wld—Jan. 21, 1909. No. 1868.

System of the Philadelphia Electric Company. Illustrated account of the methods of generation, distribution and sale of electrical energy. 5500 w. Elec Wld—May 27, 1909. No. 5224.

The Easton Gas and Electric Company's plant. Edward T. Binns. Description of a large steam and water power electric plant. Ills. 1650 w. Power—June 8, 1909. No. 5320.

New Turbine Plant at Allentown, Penn. John I. Baker. Illustrates and describes an alternating-current plant with special facilities for handling coal and ash. 3000 w. Power—Jan. 5, 1909. (Special No.) No. 1484 D.

Hampton Power Plant of the D., L. & W. R. R. Warren O. Rogers. Illustrated description of a large central plant supplying steam to fire collieries and electricity to fifteen additional mines. 3000 w. Power—Jan. 19, 1909. No. 1832.

Bennings Power House of Potomac Electric Co. F. L. Johnson. Illustrated description of a station in the District of Columbia, which furnishes current for lighting and power. 2500 w. Power—March 30, 1909. No. 3585.

The Columbus Municipal Lighting Plant. G. H. Gamper. Illustrated detailed description of this turbine plant. 6500 w. Ohio Soc of Mech, Elec & Steam Engrs, No. 141—Nov., 1908. No. 904 N.

Central Station Development at Lawrenceville, Ill. Illustrates and describes a reconstructed station, reviewing its history. 2500 w. Elec Wld—Aug. 5, 1909. No. 6902.

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Power System of Louisville Lighting Co. Osborn Monnett. Illustrated description of a single-phase engine installation, remodeled into a two-phase turbine plant. 3500 w. Power—April 13, 1909. No. 3918.

New Features of Central Station Service in Chicago. F. H. Bernhard. Illustrated detailed description of the three generating plants, the transmission system and substations. 5000 w. Elec Rev, N Y—May 29, 1909. No. 5164.

Quarry Street Station of the Commonwealth Edison Company, Chicago. William Keily. Illustrates and describes the characteristics of this important station, pointing out the reasons for its creation. 5000 w. Elec Wld—Jan. 2, 1909. No. 1470.

Power Station of the Chicago, Lake Shore & South Bend Railway. Illustrated detailed description of the station and its equipment. 3500 w. Elec Ry Jour—April 17, 1909. No. 3968.

Municipal Plant at Marshfield, Wisconsin. Louis B. Carl. Illustrated description of the electric-light plant and waterworks, and report of operating expenses. 1600 w. Power—April 20, 1909. No. 4047.

Plant of the Commonwealth Power Company Osborn Monnett. Illustrated description of a central station in Milwaukee, for supplying a group of buildings with light and power. 3000 w. Power—July 27, 1909. No. 6695.

Power Generating System and Records of the Twin City Rapid Transit Co. Description of the new Hennepin Island Power Station, Minneapolis, and recent additions to the steam power station. Ills. 4500 w. Elec Ry Jour—June 5, 1909. No. 5250.

Operating Features of the Spy Run Power House. M. J. Kehoe. Abstract of a paper before the Cent. Elec. Ry. Assn. Gives the principal features of the station and the operation. 2000 w. Elec Ry Jour—June 12, 1909. No. 5358.

The Design of a Power Plant for a Street Railway for Iowa City. John Scherner. Extract from a prize thesis. Considers the location, capacity and type of plant and the selection of apparatus. 4500 w. Transit—June, 1909. No. 6481 N.

Central-Station Practice and Results from Waterloo, Ia. Illustrated description of a progressive management. 2500 w. Elec Wld—June 10, 1909. No. 5400.

Central Power Plant at the U. S. Navy Yard, Charleston, S. C. A. P. Ball. De-

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scribes a new plant replacing several small stations and supplied with two 500-k. w. turbo-generators. Ills. 2000 w. Elec Wld—June 3, 1909. No. 5271.

Oakland (Cal.) Steam Auxiliary Station for Great-Western Power Company. Describes the equipment apparatus installed. Ills. 1500 w. Elec Wld—Sept. 23, 1909. No. 8041.

Sixteen Months Record at Redondo. Gives operating results at this reciprocating-engine station in California. 1200 w. Power—Oct. 19, 1909. No. 8771.

Small English Central Station. Charles Dawson. Illustrated description of practice in small English towns. 1200 w. Elec Wld—July 1, 1909. No. 6104.

Leeds Electricity Undertaking. Illustrates and describes extensions to the lighting station for power supply purposes. 2500 w. Elect'n, Lond—March 12, 1909. Serial. 1st part. No. 3405 A.

Electricity Supply at St. Albans. Illustrated description of an English plant combining a refuse destructor and generating station. 3000 w. Elec Engng—Dec. 24, 1908. No. 1516 A.

Walthamstow Electricity Station. Illustrates and describes the installation of a steam plant in England. 2000 w. Tram & Ry Wld—May 6, 1909. No. 4953 B.

The Liège Power Station at Sclessin (La Centrale Electrique du Pays de Liège, à Sclessin). J. Izart. A 6,000 kw station driven by Parsons turbines. Ills. Serial. 1st part. 4000 w. L'Elec—Oct. 3, 1908. No. 528 D.

The Electric Power Supply of Marseilles (L'Alimentation de Marseille en Energie électrique). J. Izart. An illustrated description of the Saint-Giniez station. Serial. 1st part. 2800 w. L'Elec—Nov. 21, 1908. No. 1114 D.

The Cap Pinède Station of the Marseilles Electric Company (Usine électrique de la Cie d'Electricité de Marseille au Cap Pinède). Illustrated description. 3000 w. Génie Civil—April 17, 1909. No. 4838 D.

Electric Light and Power Plants in Connection with the Altona Power Station and the Ohlsdorf Stations and Shops (Elektrische Licht- und Kraftanlagen im Anschluss an das Kraftwerk Altona und der Betriebs- und Werkstätten-Bahnhof Ohlsdorf). H. v. Gliniski. Illustrated detailed description. Serial. 1st part. 2500 w. Glasers Ann—Oct. 15, 1908. No. 585 D.

The Electric Plants of the Lauchhammer Company (Die elektrischen Anlagen der Aktiengesellschaft Lauchhammer). Herr Krumbiegel. Illustrated description

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of an extensive power plant for a manufacturing works. 5500 w. Zeitschr d Ver Deutscher Ing—Nov. 7, 1908. No. 1189 D.

Electric Power Plant at the Gouley Mine of the Eschweiler Mining Company (Elektrische Kraftverteilungsanlage auf Grube Gouley des Eschweiler Bergwerksvereins). L. Haas. Illustrated detailed description. Serial. 1st part. 2100 w. Elek Kraft u Bahnen—Jan. 4, 1909. No. 2822 D.

Large Central Stations in Light-Railway Development (Wirtschaftliche Bedeutung grosser Ueberlandzentralen für die Entwicklung des Kleinbahnwesens). O. Petri. An economic discussion. Ills. Serial. 1st part. 1800 w. Elek Kraft u Bahnen—May 24, 1909. No. 5954 D.

A Twenty Thousand Horse-Power German Municipal Steam Turbine Plant. Frank C. Perkins. Describes the Frankfurt-on-the-Main plant. Ills. 1350 w. Can Engr—June 4, 1909. No. 5389.

The Berlin System of Central Stations. Frank Koester. An illustrated account of the growth of the "Berliner Electricitäts Werke" and the operation of the system of central stations and distribution. 3500 w. Engineering Magazine—Nov., 1909. No. 8835 B.

The New Firenze Central Station of the Italian State Railways (La nuova Centrale elettrica nelle Officine delle Ferrovie dello Stato a Firenze e le relative Esperienze di Rendimento). Illustrated description of this gas power station. Serial. 1st part. 2500 w. Ing Ferro—Sept. 16, 1909. No. 8643 D.

The Power Plant and Transmission System of Castelnovo-Valdarno, Italy. An illustrated description of a steam power plant installed at lignite mines, generating electrical energy which is transmitted to surrounding cities and towns. 2200 w. Elec Rev, N Y—Dec. 12, 1908. No. 935.

Auxiliary Steam-Driven Electric Station at Rome, Italy. S. B. Jones. Illustrated detailed description. 2000 w. Elec Wld—June 24, 1909. No. 5891.

Electrical Development in Victoria. H. R. Harper. Abstract of presidential address before the Elec. Assn. of Victoria. 3000 w. Elec Engr, Lond—Sept. 17, 1909. No. 8110 A.

Electrical Development in Victoria. H. R. Harper. Presidential address before the Elec. Assn. of Victoria. A review of the progress made in the use of electricity. 4500 w. Aust Min Stand—Aug. 4, 1909. No. 7635 B.

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Sydney Municipality Electrical Undertaking. Abstract of report by Major Cardew on the condition and extension of this large plant. Ills. 1500 w. Aust Min Stand—April 28, 1909. No. 5396 B.

A New Electrical Generating Station at Buenos Ayres. Illustrates and describes the large central station in course of construction. 2500 w. Engr, Lond—Sept. 10, 1909. No. 7868 A.

Electric Power Installation at Khar-toum. Illustrated description of a large modern electric plant recently erected. 3000 w. Engng—Feb. 12, 1909. No. 2594 A.

See also Refuse Disposal, under CIVIL ENGINEERING, MUNICIPAL; Gas Engines and Gas Power Plants, under MECHANICAL ENGINEERING, COMBUSTION MOTORS; Steam Heating, under MECHANICAL ENGINEERING, HEATING AND COOLING; Turbines, under MECHANICAL ENGINEERING, STEAM ENGINEERING; and London, under STREET AND ELECTRIC RAILWAYS.

Cost.

Representative Steam-Plant Operating Costs. Howard S. Knowlton. A comparative study of itemized costs. 2500 w. Engineering Magazine—Feb., 1909. No. 2163 B.

Comparative Energy Costs in Two Central Stations. Gives comparative figures and discusses results. 1200 w. Elec Wld—April 1, 1909. No. 3753.

Relation of Load Factor to Power Costs. Papers on this subject by E. W. Lloyd, C. A. S. Howlett, and J. M. S. Waring, discussed together. 9500 w. Jour W Soc of Engrs—April, 1909. No. 4789 D.

Labor Costs in Central Stations. Howard S. Knowlton. Analyzes the working results of nine plants, and the influences affecting economy. 2500 w. Engineering Magazine—Sept., 1909. No. 7418 B.

Power Costs in a 5000-Kilowatt Central Station. H. S. Knowlton. Gives the record of four years' cost of power in a New England central station. 1000 w. Power—Feb. 9, 1909. No. 2382.

The Progress of Electrical Design in Relation to the Reduction of Capital Cost. Miles Walker. Abstract of presidential address before the Manchester Local Section of the Inst. of Elec. Engrs. 2200 w. Elec. Engr, London—Nov. 13, 1908. No. 433 A.

Results of Central Station Operation (Ueber Ergebnisse aus Elektrizitäts-werks-Betrieben). H. Hanszel. Gives

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curves showing in detail comparative costs in steam, oil and gas stations. Ills. 2800 w. Zeitschr f d Gesamte Turbinenwesen—July 20, 1909. No. 7289 D.

Cost Keeping.

Cost Keeping in the Central Station Contracting Department. Ludwig Kemper. From a paper read before the N.-W. Elec. Assn. Describes the system used at Albert Lea, Minn. 1000 w. Elec Wld—Jan. 28, 1908. No. 2127.

Cost Systems.

A System of Cost and Time Keeping in Use at the Columbus, O., Municipal Electric Lighting Plant. G. H. Gamper. Extract from a paper read before the Ohio Soc. of Mech., Elec. & Steam Engrs. 1500 w. Eng News—Dec. 3, 1908. No. 776.

Design.

Prime Movers. Charles P. Steinmetz. Discusses the features of prime movers and the suitability of different types for the requirements of electric service. 5500 w. Pro Am Inst of Elec Engrs—Feb., 1909. No. 2419 F.

Discussion on "Prime Movers," New York, February 19, 1909. Gives the discussion of papers by Charles P. Steinmetz. 7000 w. Pro Am Inst of Elec Engrs. May, 1909. No. 4995 F.

Power House Design from an Insurance Viewpoint. From an article by C. B. MacKinney. 1500 w. Eng Rec—March 13, 1909. No. 3109.

Simplicity in Design. Alington Johnston. Shows the necessity of adopting the simplest methods of arrangement of steam and electrical machinery in a generating station to facilitate easy operation. 1200 w. Elec Rev, Lond—Oct. 8, 1909. No. 8864 A.

Determining the Power Requirements of a Central Station (Remarques sur la Détermination de la Puissance des Centrales électriques). J. F. Audouin. Discusses provision for overload capacity, etc. Ills. 2000 w. Rev Indus—June 12, 1909. No. 6544 D.

See also Power Plants, under MECHANICAL ENGINEERING. POWER AND TRANSMISSION.

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Isolated Power Plant Costs and Their Relation to Central Station Service. W. F. Lloyd. An analysis of costs and discussion of rates. 2500 w. Elec Wld—Nov. 28, 1908. No. 635.

Profitable Day Loads for the Central Station. S. A. Fletcher. Suggests domestic and commercial applications of elec-

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tric current. 2200 w. Elec Jour—June, 1909. No. 5551.

The Extension of Electric Service to Outlying Communities. Abstract of paper by J. S. Knowlson, before Northwestern Electrical Assn, in which the opportunities for small as well as large generating stations to extend their service are indicated. 2400 w. Elec Rev, N Y—June 5, 1909. No. 5426.

Electric Power. Henry J. Gille, Presented at convention of the N. E. L. A. Analyzes the effect of various classes of power on station loads, and the advantage of obtaining power load that does not come on the peak. 4000 w. Elec Age—Sept., 1909. No. 7840.

Central Station Electric Motor Service. Walter Stuart Kelley. Considers the underlying principles that should govern the design for an electrical energy distribution system, from the viewpoint of the central station. 3000 w. Elec Wld—Oct. 7, 1909. No. 8395.

The Public Supply of Electric Power. G. L. Addenbrooke. Discusses the economic and technical sides of the question in the United Kingdom. 8500 w. Jour Soc of Arts—July 9, 1909. Serial, 1st part. No. 6412 A.

Domestic Electricity Supply (Including Heating and Cooking) is Affected by Tariffs. W. R. Cooper. Considers the importance of so adjusting tariffs that electric heating and cooking may be encouraged. 8500 w. Inst of Elec Engrs—Nov. 26, 1908. No. 863 N.

The Advantage of Combining a Railway Load with a General Lighting and Power Load (Ueber die Vorteile, welche die Vereinigung von Bahnstromabgabe und allgemeiner Licht- und Kraftversorgung gewährt). Bruno Thierbach. 2800 w. Elek Kraft u Bahnen—July 3, 1909. No. 7459 D.

Notes on the Electrical Industry (Note sur l'Industrie de l'Energie électrique). A. Alby. A review of tendencies in the electrical industry, particularly the development of large distribution systems in Europe and America. Ills. 18500 w. Bul Soc d'Encour—July, 1909. No. 7917 G.

Germany.

German Central Stations. Notes taken from *La Lumière Electrique*. Information showing the growth of the German electrical industry and related subjects. 1500 w. Elect'n, Lond—Jan. 29, 1909. No. 2346 A.

German Central-Station Statistics and the Proposed Taxation of Electrical Ser-

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vice. Information of the growth, and the Government's reasons for the proposed taxation. 1200 w. Elec Wld—April 1, 1909. No. 3752.

Great Britain.

Some Comparisons of the Electrical Industry in This Country and Abroad. W. M. Mordey. Inaugural address before the Institution of Electrical Engineers on Nov. 19. 5000 w. Engng—Dec. 11, 1908. No. 1218 A.

Central-Station Commercial Development in Great Britain. Francis H. Davies. A brief review of progress. 1800 w. Elec Wld—Oct. 14, 1909. No. 8557.

Hydro-Electric.

The Analysis of an Hydro-Electric Project. H. von Schon. The features of the market analysis are discussed, the power load inquiry, the power output, the cost, etc. General discussion. 13000 w. Jour W Soc of Engrs—Dec., 1908. No. 1856 D.

The Cost of Installation and Operation of Hydro-Electric Plants (Notes sur le Cout d'Etablissement et d'Exploitation des Usines hydraulico-électriques). J. Izart, from an article by K. Thielsch in the *Zeitschrift für das gesamte Turbinenwesen*. Ills. Serial. 1st part. 2000 w. L'Elecn—Feb. 6, 1909. No. 3330 D.

American Hydro-Electric Construction Work Abroad. H. Lester Hamilton. Illustrates and describes important installations in various countries. 3000 w. Cassier's Mag—Jan., 1909. No. 1728 B.

Hydraulic-Power Development on the Pacific Coast. Frederic A. C. Perrine. Explains the peculiar climatic and meteorological conditions affecting power development in California. 3000 w. Cassier's Mag—March, 1909. No. 2925 B.

Hydro-Electric Power in Canada. Cecil B. Smith. A review of the progress in developing water-powers, describing the conditions, topography, etc. Maps. 14000 w. Pro Am Soc of Civ Engrs—May, 1909. No. 5107 E.

Hydro-Electric Power in Canada. Discussion of the paper by Cecil B. Smith. Ills. 1500 w. Pro Am Soc of Civ Engrs—Sept., 1909. No. 8186 E.

The Utilization of Water Powers (La Houille blanche, Installation et Utilisation des Chutes d'Eau). Achille Bergès. Refers particularly to the problems of France. Serial. 1st part. 4000 w. Elecn—April 10, 1909. No. 4824 D.

The Architecture of Hydro-Electric Stations. Frank Koester. Illustrated discussion of building designs. 2000 w.

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Cassier's Magazine—June, 1909. No. 5541 B.

Injury to Water-Power Plants by Municipal Water-Works. Gives a recent decision of the Michigan Supreme Court in a case. 2500 w. Eng Rec—Sept. 11, 1909. No. 7673.

Non-Attendance Electrical Plant at Westfield, Mass. Brief illustrated description of an almost automatic plant which has been in operation about six years. 800 w. Elec Wld—May 20, 1909. No. 5043.

A. Farm Hydro-Electric Plant Without Operating Attendant. P. J. O'Gara. Description of a domestic plant automatically controlled from a residence a quarter of a mile from the waterfall. Supplies power to a house and farm at an initial cost of less than \$1,500. Ills. 3000 w. Elec Wld—June 3, 1909. No. 5272.

Harnessing the Torrents. Describes the work of conserving and utilizing the water power of the Susquehanna and the Connecticut rivers. Ills. 2200 w. Pub Works—Jan-March, 1909. No. 5645 D.

A Low-Head Hydroelectric Development. S. Rice. An interesting plant at Milford, Me., to develop 12,000 h. p. under a head of 20 feet, is described. Ills. 2200 w. Power—Feb. 9, 1909. No. 3274.

Sewalls Falls Plant Near Concord, N. H. S. Rice. Illustrated description of a 2000-k.w. water power plant containing the first installation of vertical multi-runner direct-connected open-flume turbine. 2500 w. Power—May 25, 1909. No. 4978.

Vernon, Vt., Hydroelectric Development. C. E. Bascom. Illustrated description of large water-power plant with three rotor vertical turbines designed for 30-ft. head and operation under extremes of water level. 1500 w. Power—Sept. 28, 1909. No. 8142.

Hydro-Electric Development of the Connecticut River Power Company. Illustrated description of a plant and transmission line serving a number of towns and cities. 1800 w. Elec Wld—Sept. 9, 1909. No. 7620.

The Hydro-Electric Plant of the Connecticut River Power Company. Illustrated detailed description of a development to furnish power for cities in Massachusetts, New Hampshire and Vermont, over a radius of 60 miles. 3000 w. Eng Rec—March 27, 1909. No. 3536.

The Construction of the Plant of the Connecticut River Power Company. George S. Hewins. Illustrated detailed description of engineering and concrete

construction work. 3500 w. Eng Rec—April 3, 1909. No. 3714.

The Hydro-Electric Plant of the Uncas Power Company at Scotland, Conn. Illustrated description of a power development on the Shetucket River; the power to be transmitted to Norwich, 11 miles distant. 4500 w. Eng Rec. Nov. 21, 1908. No. 411.

Hydroelectric Plant of the Schenectady Power Company. C. T. Wilkinson. An illustrated detailed description of the Schaghticoke development on the Hoosic River. 3000 w. Elec Rev, N Y—March 27, 1909. No. 3530.

Divided-Fall Hydro-Electric Developments on the Hoosic River. An illustrated account of a development of unusual interest because of the duplex plant found necessary. 2500 w. Elec Wld—May 20, 1909. No. 5041.

The Hoosic River Development of the Schenectady Power Company. Illustrated description of details at the Schaghticoke plant, and at the Johnsonville plant. These plants are capable of independent operation, though essentially parts of one development. 2500 w. Eng Rec—July 24, 1909. Serial, 1st part. No. 6643.

System of the Rochester Railway & Lighting Company. Illustrated description. The chief source of power is the Genesee River, but steam-driven generators are used and power is also transmitted from Niagara Falls. 2000 w. Elec Wld—Jan. 14, 1909. No. 1788.

Large Water-Power Stations of the Rochester Railway & Light Company. Illustrated descriptions of stations 4 and 5. 2000 w. Elec Wld—Jan. 28, 1909. No. 2125.

The Hydro-Electric Plant of the Wallkill River Company at Walden, N. Y. Harry W. Dennis. An illustrated description of the development of this small water-power. 3000 w. Cornell Civ Engr—April, 1909. No. 3949 C.

The McCall's Ferry Hydro-Electric Power Plant. William Allen. Brief illustrated description of work under construction, costing about \$10,000,000. 1500 w. Sci Am—March 13, 1909. No. 3132.

Work on the McCall's Ferry Hydroelectric Development. Henry Hale. An illustrated account of this large plant on the Susquehanna River. 2000 w. Elec Rev, N Y—Feb. 27, 1909. No. 2855.

The New Power Station of the McCall Ferry Power Company. Newton Harrison. Illustrated description of this station on the Susquehanna River. 2000 w. Cent Sta—June, 1909. No. 5152.

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An Extensive Power System in the South. Cecil P. Poole. Illustrated account of the development of the Southern Power Co., in the Carolinas. 4000 w. Power—Jan. 5, 1909. (Special No.) No. 1478 D.

The Early Construction Methods at the Plant of the Central Georgia Power Company. Illustrated description of work on an extensive development on the Ocmulgee River, Georgia. 3500 w. Eng Rec—April 17, 1909. No. 4011.

Development of the Rocky Creek Station of the Southern Power Company. Illustrated description of a development on the Catawba River. 6500 w. Eng Rec—April 3, 1909. No. 3720.

The Tennessee River Power Development at Hales Bar. Illustrates and describes work in progress near Chattanooga. 3500 w. Eng Rec—April 3, 1909. No. 3721.

Combination System of the Hydro-Electric & Gas Company of Warren, Ohio. Illustrates and describes a system uniting a number of water-powers of various heads, at scattered points, into a single system, delivering the energy where a steam engine and gas-engine auxiliary are used on the same system, all operating in parallel. 4000 w. Elec Wld—Sept. 2, 1909. No. 7526.

A Low-Head Hydro-Electric Development at Berrien Springs, Michigan. Illustrated description of a development on the St. Joseph River. 4000 w. Eng Rec—Dec. 26, 1908. No. 1248.

A Low-Head Hydro-Electric Development, Near Escanaba, Mich. Brief illustrated description. 1500 w. Eng Rec—May 15, 1909. No. 4696.

Hydro-Electric Generating Station of the Great Western Power Company on the Feather River. Illustrated description of the development, and of the generating equipment, of interest because of the size. 2000 w. Elec Wld—Aug. 26, 1909. No. 7351.

Electrical Equipment of the Great Western Power Company. Illustrates and describes interesting details of the electrical part of the equipment. 1800 w. Elec Wld—Sept. 16, 1909. No. 7772.

The Hydro-Electric Development of the Southern Wisconsin Power Company. Illustrated detailed description of a long-distance transmission from a plant near

The Kilbourn Hydroelectric Plant. Illustrated detailed description of an interesting power development on the Wisconsin River. 4000 w. Elec Rev, N Y—Aug. 28, 1909. No. 7403.

Kilbourn, Wis. 6000 w. Eng Rec—Sept. 4, 1909. No. 7555.

The Construction of the Hydro-Electrical Developments at Kilbourn, Wisconsin. Illustrated detailed description of the construction plant and methods which are quite out of the ordinary. 4000 w. Eng Rec—Sept. 18, 1909. No. 7815.

Low-Head Hydro-electric Development on Tippecanoe River at Monticello, Ind. Illustrated detailed description of an interesting moderate-sized water-power development. 1800 w. Elec Wld—Oct. 21, 1909. No. 8808.

The Hennepin Power House of the St. Anthony Falls Water Power Company. R. D. Thomas. Illustrated description of a plant at Minneapolis, which utilizes the flood waters of the Mississippi River. 2000 w. Eng Rec—May 29, 1909. No. 5142.

Sioux Falls Hydro-Electric Development. Illustrated description of a plant in South Dakota for a city of about 16,000 inhabitants. 1500 w. Elec Wld—April 22, 1909. No. 4435.

Sioux Falls Hydro-Electric Development. Simpson Rice. Illustrated description of a plant of interest on account of the provisions made to take care of flood water, and unusual arrangements and construction. 3000 w. Power—June 22, 1909. No. 5811.

Great Falls, Montana. Brief illustrated description of the different falls and power plants. 2000 w. Mines & Min—March, 1909. No. 2952 C.

Development of Water Power at Great Falls. Alexander Leggat. Illustrated description of these falls on the Missouri River, which form one of the great water-powers of the world, and of their development. 4000 w. Min Wld—July 24, 1909. No. 6654.

Water Power and Irrigation in Southwestern Colorado. F. Parkman Coffin. Describes the hydro-electric developments of the Telluride Power Co., and the Animas Power & Water Co. Ills. 2500 w. Harvard Jour of Engng—April, 1909. No. 4931 D.

The Hydro-Electric Developments of the Nevada-California Power Company. H. D. Chapman. Illustrated detailed description of the developments in Inyo County, Cal., utilizing the waters of Bishop Creek, and furnishing power for Nevada mines. 2500 w. Eng Rec—March 6, 1909. No. 2971.

The Cedar River Power Development of the City of Seattle, Washington.

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Louis P. Zimmerman. Illustrated detailed description of the largest municipal hydro-electric plant in the United States. 3000 w. Eng News—June 17, 1909. No. 5574.

Some Problems in Designing the Kern River No. 1 Hydro-Electric Power Plant. F. C. Finkle. An illustrated account of very important problems in hydro-mechanics solved successfully in the design and construction of this power development for the Los Angeles Edison Co. 6500 w. Eng News—Dec. 24, 1908. No. 1236.

Stanislaus River Electric Power Development. O. M. Boyle, Jr. Illustrated description of this project in California. 3500 w. Cal Jour of Tech—April, 1909. No. 4759.

Water Power Development in and About Quebec. Illustrated descriptions of the three large power concerns furnishing light and power to the city. 4500 w. Can Elec News—June, 1909. No. 5465 C.

Hydro-Electric Plant in British Columbia. Illustrated description of the West Kootenay power scheme, with description of the region. 5500 w. Engr, Lond—Nov. 6, 1908. No. 326 A.

The Municipal Hydro-Electric Works for Winnipeg. Brief account of the undertaking, with plan and cross section through power-house. 1000 w. Eng Rec—Oct. 9, 1909. No. 8439.

The High Head Hydro Electric Development at Loch Leven, Scotland. J. Murray S. Culbertson. Plan, and illustrated detailed description of the new plant for the British Aluminum Co. 3000 w. Eng Rec—May 1, 1909. No. 4388.

Water Power Plants in Sweden and Norway. A description of the more important plants completed and projected. Ills. 4500 w. Engng—March 12, 1909. Serial. 1st part. No. 3417 A.

Regulation and Hydro-Electric Works of the Skien River, Norway. (Seereguleringer og Wasserkraftanlagen im Gebiet des Skienflusses in Norwegen). Herr Dubislav. Describes several interesting works. Ills. Serial. 1st part. 2800 w. Zeitschr f d Gesamte Turbinenwesen—May 29, 1909. No. 5781 D.

Hydro-Electric Plant of the Norwegian Nitrogen Products Company at Svålgfos, near Notodden (Usine hydro-électrique de la Société Norvégienne de l'Azote, à Svålgfos, près Notodden, Norvège). Sam Eyde and S. Kloumann. Illustrated description of a plant generating energy for the nitrate works. Serial. 1st part. 5000 w. Génie Civil—May 15, 1909. No. 5739 D.

The Svålgfos Electric Plant of the

Norwegian Nitrogen Products Company at Notodden, Norway (Das Kraftwerk Svålgfos der Norsk hydro-elektrisk Kvälstofaktieselskab bei Notodden in Norwegen). Sam Eyde and S. Kloumann. Illustrated description. Serial. 1st part. 5000 w. Zeitschr d Ver Deutscher Ing—May 1, 1909. No. 5957 D.

The Hydro-Electric Power Plant at Svålgfos, Norway. Translation of article by S. Eyde and Kloumann in the *Zeitschrift* of the Soc. of German Engrs. Illustrated detailed description. 5400 w. Eng Rec—Sept. 11, 1909. No. 7670.

Power Developments on the Glommen (Stand der Wasserkraftausnutzung am Glommen). Herr Dubislav. Describes the electric plants on this river in Norway. Ills. Serial. 1st part. 1500 w. Zeitschr f d Gesamte Turbinenwesen—Sept. 10, 1909. No. 8677 D.

Swedish Hydro-Electric Power-Plants. John George Leigh. An illustrated review of the development of the hydraulic power of Scandinavia. 4500 w. Cassier's Mag—May, 1909. No. 4403 B.

The Swedish State Electric Power-Station at Trollhättan. Plan and description of a development on the Göta River, in Sweden. 2500 w. Engng—Dec. 18, 1908. No. 1370 A.

A Recent Swedish Hydro-Electric Plant. P. Frenell. Illustrated description of features of interest in the Hemsjö plant, showing the advantage of storage of water. 4500 w. Elec Wld—Jan. 7, 1909. No. 1667.

The Hemsjö Power Company, Sweden. P. Frenell. Illustrated description of features of this hydro-electric plant showing the latest electrical developments in Sweden. 1400 w. Elect'n, Lond—Jan. 8, 1909. Serial. 1st part. No. 1808 A.

The Trollhattan Hydro-Electric Plant, Sweden (L'Usine Hydro-Electrique de Trollhattan, Suède). J. Bally. Illustrated detailed description. 3500 w. Génie Civil—July 3, 1909. No. 7227 D.

The Orlu Hydro-Electric Plant, Ariège, France (L'Usine hydroélectrique d'Orlu, Ariège). E. Pacoret. Illustrated detailed description of this important station in the Pyrenees. Serial. 1st part. 2000 w. Tech Mod—Sept., 1909. No. 8616 D.

The Augst Water-Power Plant near Basel (Wasserkraftanlage Augst bei Basel). Josef Rosshändler. Illustrated description of this 30,000 horse power plant. 2500 w. Zeitschr d Oest Ing u Arch Ver—Oct. 9, 1908. No. 580 D.

The Burglauenen Electric Plant (Das Elektrizitätswerk Burglauenen). E. Frofé.

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Illustrated description of an interesting Swiss hydro-electric plant and pipe line. Serial. 1st part. 2000 w. Schweiz Bau—May 15, 1909. No. 5768 B.

Italian Power Plants as Seen Through American Eyes. S. Q. Hayes. Describes features of interest in the Brusio plant observed by writer. Ills. 3500 w. Elec Jour—Feb., 1909. No. 2736.

A 50000-Volt Transmission System. Frank C. Perkins. The Brusio-Campocologna, the largest hydro-electric plant in Switzerland is illustrated and described. 2000 w. Sci Am Sup—Jan. 9, 1909. No. 1647.

The Brusio Central Station. J. B. Van Brussel. Illustrated description of an important hydro-electric installation in Switzerland. 2500 w. Power—Oct. 5, 1909. No. 8317.

The Montcherand Hydro-Electric Plant (L'Usine hydro-électrique de Montcherand). P. Schmetz and V. Abrezol. Illustrated detailed description of a 4,000 horse power plant. Serial. 1st part. 1000 w. Bul Tech d l Suisse Romande—Feb. 25, 1909. No. 3335 D.

German 50000-Volt Transmission System. Illustrated description of a new municipal hydro-electric plant recently completed for the city of Munich. 3500 w. Elec Wld—Nov. 28, 1908. No. 632.

The Altbach Hydro-Electric Plant (Elektrizitätswerk Altbach). Wilhelm Müller. Illustrated description. 2500 w. Die Turbine—Sept. 20, 1909. No. 8676 D.

The Walchensee Hydro-Electric Plant Competition (Vom Wettbewerb um die Walchensee-Wasserkraft-Anlage). Fritz Eiselen. Describes the designs of the six prize winners. Ills. Serial. 1st part. 2000 w. Deutsche Bau—July 21, 1909. No. 7281 B.

The Kaaden Hydro-Electric Plant on the Eger (Das Elektrizitätswerk an der Eger der Stadt Kaaden). W. Werner. Illustrated description of this important installation in Austria. Ills. 2200 w. Oest Wochenschr f d Oeffent Baudienst—June 19, 1909. No. 6700 D.

Hydro-Electric Plants on the Kerka River in Dalmatia (Hydroelektrische Anlagen am Kerkafusse in Dalmatien). Hugo Tenzer. Illustrated description of several plants. Serial. 1st part. 1600 w. Elektrotech u Maschinenbau—Oct. 4, 1908. No. 593 D.

Dalmatian Carbide Works Using 30,000-Volt Generator. Frank Koester. Illustrated detailed description of the Manojlovac power plant, Dalmatia. 2800 w. Elec Rev, N Y—Jan. 9, 1909. No. 1657.

Municipal Electric Plant in Karlstadt, Croatia (Das städtische Elektrizitätswerk in Karlstadt, Kroatien). Karl Thien. Illustrated description. 3000 w. Elektrotech u Maschinenbau—May 16, 1909. No. 5955 D.

The Marklissa Dam and Hydro-Electric Power Plant. C. Bachmann. Abstract translation from *Zeit. für Bauwesen*. Brief illustrated description of the river regulation and power development works. 1500 w. Eng Rec—Sept. 25, 1909. No. 8065

Generating and Transmission Plants of the Società Angelo-Romana (Le Officine e gli Impianti elettrici per il trasporto di Forza della "Società Angelo-Romana"). Illustrated detailed description. Power is generated at Tivoli and transmitted to Rome. Serial. 1st part. 2700 w. Industria—Jan. 3, 1909. No. 2651 D.

The la Vis Hydro-Electric Plant at Madières (Usine hydro-électrique de la Vis à Madières, Hérault). Michel Berthon. Illustrated detailed description of a 5000 horse-power plant. 500 w. Génie Civil—Jan. 23, 1909. No. 2613 D.

Hydro-Electric Power Plant on the Piabanha River, Brazil. Illustrated description of one of the largest hydro-electric stations in South America. 1800 w. Elec Wld—Nov. 14, 1908. No. 224.

Lages River Hydraulic Development Near Rio de Janeiro. Describes this recent development in Brazil. 2000 w. Eng Rec—May 22, 1909. No. 4928.

The Hydro-Electric Power Plant of the Rio de Janeiro Tramway, Light, & Power Company. L. L. Perry. Illustrated description of this hydro-electric plant in Brazil. 3000 w. Elec Wld—May 6, 1909. No. 5037.

A Hydro-Electric Installation in Nyassa-Land. Alexander Spence Chalmers. Illustrated description of a plant of simple construction to be operated by skilled native labor. 1600 w. Inst of Civ Engrs. No. 3789. No. 8163 N.

City of Launceston, Tasmania. Explains four propositions submitted to improve the hydraulic power from the South Esk River. 3500 w. Aust Min Stand—June 30, 1909. No. 6868 B.

The New Tokio Hydro-Electric Plant at Katsuragawa (Das neue, bei Katsuragawa errichtete Elektrizitätswerk der Stadt Tokio). F. Drexler. Illustrated description. 2100 w. Die Turbine—Jan. 5, 1909. No. 2608 D.

See also Central Stations, under GENERATING STATIONS; Pipe Lines and Weirs, under CIVIL ENGINEERING, WATER

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Isolated Plants

SUPPLY; Coffor Dams and Water Powers, under CIVIL ENGINEERING, WATERWAYS AND HARBORS; Turbine Plants, under MECHANICAL ENGINEERING, HYDRAULIC MACHINERY; and Tin, under MINING AND METALLURGY, MINING.

Isolated Plants.

Natural and Artificial Conservation of Water Power for Electrical Purposes. Edward R. Taylor. Illustrates and describes a number of small plants and power applications on farms, and shows the great amount of power still unused, discussing related questions. 6000 w. Jour Fr Inst--Dec., 1908. No. 968 D.

Manufacturers' Interests in Isolated Plants. Charles M. Ripley. A defense of independent power plants as compared with Central stations from the standpoint of operating costs. 3500 w. Ir Age--Jan. 7, 1909. No. 1497.

Isolated Power Plants. Richard W. Hale. A reply to C. M. Ripley's article, presenting the case for the central station. 3000 w. Ir Age--Feb. 18, 1909. No. 2508.

Central Stations versus Private Plants. Editorial discussion of how to decide as to which is the more economical system in any given case, referring to data given in a recent paper before the Inst. of Elec. Engrs. 3000 w. Engng--Feb. 26, 1909. No. 3068 A.

Isolated Plant vs. Central Station. A letter addressed to the Board of Estimate and Apportionment of New York City, by Percival Robert Moses, giving reasons why a private isolated plant should be installed in the New York public library. 2500 w. Power--April 27, 1909. No. 4311.

Alternating-Current Industrial Power Plants. Warren H. Miller. Discusses the application of alternating current to a manufacturing plant, showing what can be done in even a small installation. Ills. 3500 w. Elec Wld--June 3, 1909. No. 5273.

Residence Electric Lighting Plants. John Howatt. Brief consideration of plants for suburban or rural residences and their requirements. 1600 w. Minn Engr--Jan., 1909. No. 2732 C.

Engines for Isolated Lighting and Power Plants. Charles L. Hubbard. Discusses the best type of engines to be used for such plants. 1600 w. Elec Rev, N Y--Jan. 23, 1909. No. 2017.

Gas Engine Driven Electric Plants Versus Electric Motors Fed from Central Stations. R. D. Donaldson. A comparison

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son of costs, reliability and general running conditions of small gas engines generating electricity for manufacturing versus the purchase from a central station. 1200 w. Elec Wld--Oct. 7, 1909. No. 8396.

The Relation Between Engine-Room and School-Room, and How to Attain It. Discussion of the operation of the isolated plant and the proposed plan to require two years' actual service before admitting a young man to apprenticeship. 1300 w. Elec Age--May, 1909. No. 5428.

The Model Operation of an Isolated Plant. Illustrated detailed description of the method of operating the mechanical plant of the St. Regis Hotel, New York City; the cost records and efficiency. 2500 w. Elec Age--Jan., 1909. No. 1862.

The New Power Plant of Pacific Mills. Illustrated description of the steam turbine-generator installation at Lawrence, Mass. Mills for the manufacture of textile goods. 2000 w. Elec Rev, N Y--Jan. 2, 1909. No. 1467.

The Power Plant of the Hoboken Passenger Terminal of the Lackawanna Railroad. Plans and detailed description of the new central station built for lighting, heating and power for this terminal. 3000 w. Eng Rec--Feb. 13, 1909. No. 2450.

Operating Results of an Isolated Power Plant at Binghamton, N. Y. Information concerning the plant of the Security Mutual Life Insurance Co., which has shown very good results in operation. Ills. 3000 w. Eng Rec--July 24, 1909. No. 0649.

The Electrical Equipment of the Gorham Manufacturing Company. C. E. Fairbanks. Illustrated description of the equipment of an industrial plant having varied requirements for the use of electricity. 2000 w. Elec Wld--May 6, 1909. No. 5030.

Power Plant of the Heath & Milligan Paint Works, Chicago. Illustrated description of a central plant for furnishing heat, light and power to various buildings. 2500 w. Eng Rec--Feb. 20, 1909. No. 2562.

Interconnections of Electrical Equipment of Indiana Steel Company, Gary, Ind. Outlines the arrangement of the generating equipment and auxiliary machinery, and gives plan and description of the switchboard. 2500 w. Elec Wld--May 13, 1909. Serial. 1st part. No. 5038.

New Turbine Power Plant of the Nairn Linoleum Company. Illustrated description of a new plant to serve a group of buildings and replace rope drives with

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electrical power. 2200 w. Eng Rec—July 10, 1909. No. 6255.

Power House of the Rock Island R. R. Shops. Osborn Monnett. Illustrated description of an alternating-current turbine plant that is featured by water supply, simple coal and ash handling facilities and electrical distribution. 3500 w. Power—Oct. 19, 1909. No. 8768.

Power Plant of the Coronet Phosphate Company. H. D. Mendenhall. A steam-turbine driven electrical generating plant in Florida is illustrated and described. 4500 w. Eng Rec—Oct. 23, 1909. No. 8707.

Electric Power Plant of the Missouri State Penitentiary. Illustrated description of a plant practically operated by convict labor. 1700 w. Elec Rev, N Y—Nov. 14, 1908. No. 276.

The Electrical Equipment of Messrs. Selfridge & Co.'s New Building in Oxford Street, London. Illustrated description of the details for electric lighting and power in a modern department store. 5500 w. Elect'n, Lond—March 5, 1909. No. 3153 A.

Electric Power in the Works of Messrs. Armstrong, Whitworth & Co., Ltd., Manchester. Illustrated detailed description of plant installed for these engineering works. 3500 w. Elec Rev, Lond—Sept. 10, 1909. Serial. 1st part. No. 7857 A.

See also Mechanical Plants, under MECHANICAL ENGINEERING, POWER AND TRANSMISSION; and Terminals, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS.

Load Curves.

Lessons from the Power Station Load Curve. H. S. Knowlton. A study of given curves, showing how to interpret them. 2200 w. Power—July 27, 1909. No. 6698.

Load Factors.

Compilation of Load Factors. E. W. Lloyd. Read before the Nat. Elec. Lgt. Assn. Information on ordinary classes of business for use of commercial men selling electrical energy for power and lighting 2500 w. Elec Rev, N Y—July 17, 1909. No. 6395.

Netherlands.

Statistics of Electric Central Stations in the Netherlands (Statistiek van Centraal Stations voor Elektrische Stroomlevering in Nederland). Gives details of each station. 5000 w. Ingenieur—Aug. 28, 1909. No. 8159 D.

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Operation.

Operating Features of Various Generating Systems. Illustrated detailed description of the efficient organization of operating forces and control of apparatus in emergencies. 17000 w. Elec Wld—May 27, 1909. No. 5225.

Parallel Operation of Turbine-Driven Central Stations. J. E. Fries. Explains the function of the turbine speed regulator, giving examples of arrangements for different conditions. 2000 w. Elec Rev, N Y—Jan. 9, 1909. No. 1659.

Flywheel Load Equalizer. J. S. Peck. Abstract of a paper read before the Manchester Sec. of the Inst. of Elec. Engrs. Discusses the use of flywheels as equalizers of the load on generating stations, and describes arrangements for d. c. and a. c. circuits. 2000 w. Elect'n, Lond—Feb. 26, 1909. No. 3053 A.

Parallel Operation.

See A. C. Dynamos, under DYNAMOS AND MOTORS.

Power Factor.

The Improvement of Power Factor in Alternating Current Systems. Miles Walker. Read before the Manchester Sec. of Inst. of Elec. Engrs. Discusses the improvement by using synchronous motors, capacity, and improving the induction motor, and describes a new type of machine, termed a "phase advancer." Ills. 4000 w. Elec Engr, Lond—Jan. 22, 1909. No. 2202 A.

Rates.

Rate Regulation of Electric Power. S. S. Wyer. Discusses the legal principles involved in the sale of electricity. 6500 w. Cassier's Mag—Jan., 1909. No. 1727 B.

Systems of Charging for Electrical Energy. W. T. Ryan. A comparison of nine principal methods. 3500 w. Engineering Magazine—April, 1909. No. 3525 B.

Central Station Rates. Abstract of paper by R. S. Wallace, at meeting of the Illinois State Elec. Assn., on "Rates and Their Relation to the Cost of Manufacture." 3500 w. Elec Wld—Jan. 7, 1909. No. 1671.

The Price of Electricity. William D. Marks. An explanation of the Marks' sliding scale. 3500 w. Elec Wld—Sept. 2, 1909. No. 7531.

An English Central-Station Rate System. A. Hugh Seabrook. Gives the writer's recommendations for a revised tariff for the Borough of St. Marylebone. 3000 w. Elec Wld—Oct. 14, 1909. No. 8558.

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Electric Power Supply Tariffs. Stuart A. Russell. Urges the more careful investigation of the cost of generating and transmitting the power. 1500 w. Elec Rev, Lond—Jan. 22, 1909. No. 2204 A.

Supply by Meter, or Contract? W. A. Toppin. Discusses the two systems and the prevention of fraud. 1200 w. Elec Rev, Lond—March 5, 1909. No. 3149 A.

Equity v. Expediency—A Tariff Question. Ernest E. Sharp. A discussion of the two-rate system. 1400 w. Elec Rev, Lond—April 23, 1909. No. 4449 A.

The Diversity Factor Amongst Lighting Consumers. Considers the estimating of the diversity factor, and the charging for lighting. 900 w. Elect'n, Lond—July 16, 1909. No. 6668 A.

Cheap Units. Alex. Sinclair. Abstract of paper and discussion before the Incor. Munic. Elec. Assn. Discusses means of determining a fair cost per unit for energy supplied to various classes of consumers. 3500 w. Elect'n, Lond—July 2, 1909. No. 6295 A.

Records.

Plans and Records for Electrical Distribution Systems. J. W. Beauchamp. Read before the Leeds Loc. Sec. of the Inst. of Elec. Engrs. General remarks with description of the system developed for Sheffield, England. 2000 w. Elec Engr, Lond—Dec. 18, 1908. Serial. 1st part. No. 1391 A.

Switch Bars.

See Switches, under DISTRIBUTION.

Switchboards.

Switchboard Notes. S. Q. Hayes. Considers features in connection with projects requiring distant control, etc. 3000 w. Elec Age—Oct., 1908. No. 48.

Notes on Switchboard Instruments. H. W. Richardson. Remarks on inspection, testing, hot wire instruments, etc. 4000 w. Elec Age—March, 1909. No. 3217.

Guide to Small Station Switchboard Design. General instructions and suggestions to station managers for laying out switchboards for small alternating and direct current plants. Diagrams. 3000 w. Power—March 9, 1909. No. 3038.

High-Tension Equipment and Control of Waterside Station No. 2 of the New York Edison Company. Illustrated detailed description of the high-tension control board. 1600 w. Elec Wld—March 25, 1909. No. 3510.

Main Switchboard of Pratt Street Power Station, Baltimore. Illustrated description of the successful arrangement of

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a very complicated output. 2000 w. Elec Ry Jour—April 24, 1909. No. 4150.

The Control Switchboards for the Power House Equipment at the Indiana Steel Company's New Gary Works. E. A. Lof. Illustrated detailed description 3500 w. Elec Rev, N Y—June 26, 1909. No. 6016.

High-Tension Switchboards with Removable Switch Carriages. Illustrated detailed description. 1500 w. Ir & Coal Trds Rev—April 23, 1909. No. 4474 A.

See also Isolated Plants, under GENERATING STATIONS; Instruments, under MEASUREMENT; and Electric Power, under MINING AND METALLURGY, MINING.

Switch Gear.

The Reyrolle Ironclad Switch-Gear. Illustrates and describes a type of high-tension switch-gear consisting of separate ironclad units, hand-operated. 3000 w. Engng—Nov. 6, 1908. No. 323 A.

Some Elementary Considerations of High-Tension Switchgear. Notes giving suggestions helpful in selecting a suitable switch. 1700 w. Elec Engr, Lond—July 16, 1909. Serial, 1st part. No. 6667 A.

Taxation.

Proposal for a Tariff on Electricity and Gas (Entwurf eines Elektrizitäts- und Gassteuergesetzes). Text of a bill before the German Reichstag to establish a tax on electricity and gas undertakings. 20000 w. Elektrotech Zeitschr—Nov. 12, 1908. No. 1302 B.

The Proposed Electricity Taxation Law and Electric Lighting (Der Entwurf des Elektrizitätssteuergesetzes in technischer Beleuchtung). Georg Dettmar. A discussion of the probable effects of the law proposed in Germany. Discussion. Ills. 25000 w. Elektrotech Zeitschr—Dec. 10, 1908. No. 2111 D.

United Kingdom.

The Electric Power Companies of the United Kingdom and Their Prospects. G. L. Addenbrooke. A review of progress. 2200 w. Elec Rev, Lond—Oct. 23, 1908. No. 72 A.

Wind Power.

Wind Power for Driving Dynamos (Utilisation du Vent comme Force Motrice pour Actionner des Dynamos). J. A. Montpellier. A discussion of the cost of wind power plants. 2000 w. L'Eclen—Dec. 5, 1908. No. 1920 D.

Arc Lamps

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Arc Lamps.

The Regenerative Flame Lamps. A. T. Mitchell. Read before the N. E. L. A. Discusses their efficiency, explaining mechanical details. Ills. 3000 w. Elec Age—June, 1909. No. 6133.

Flame Arc-Lamp Carbons. K. Odwald. Their composition, structure, special details of lamp construction, etc. Ills. 1800 w. Elec Rev, N Y—Oct. 9, 1909. No. 8423.

The Dependence of the Efficiency of Alternating-Current Flame Arc Lamps on the Nature and Amount of the Steadying Device. Report of results of recent experiments by Paul Högnér. 1200 w. Elec Engr, Lond—Dec. 25, 1908. No. 1517 A.

The Regulation of Arc Lamps with Inclined Electrodes and Deflecting Magnets (Ueber das Regulieren der Bogenlampen mit schrägen Kohlen und Blasmagneten). J. Teichmüller. An explanation of the principles. Ills. Serial. 1st part. 3500 w. Elektrotech Zeitschr—Dec. 17, 1908. No. 2112 D.

The Regulation of Alternate-Current Flame Arc Lamps. Paul Högnér. Abstract from *Electrotechnische Zeit.* Calls attention to the importance of the resistance variations, and to the fact that the use of choking coils improves the efficiency nearly 40 per cent. 1000 w. Elect'n, Lond—May 14, 1909. No. 4945 A.

The Economy of New High-Intensity Light Sources (Wesen und Wirtschaftlichkeit neuerer elektrischer Starklichtquellen). P. Heyck. A discussion of the flaming arc lamp, and the quartz lamp. Ills. 6000 w. Zeitschr d Ver Deutscher Ing—Aug. 7, 1909. No. 7999 D.

The Relation Between the Efficiency of Alternating-Current Flame Arc Lamps and the Nature and Amount of the Steadying Device (Ueber die Abhängigkeit der Lichtstärke und des Effektverbrauches bei Wechselstrom-Flammbogenlampen von der Art und Grösse der Vorschaltung). Paul Högnér. A comparison between induction coils and the resistor in series. Ills. 2000 w. Elek Zeitschr—Dec. 3, 1908. No. 2117 D.

Automobile.

See Lighting, under MECHANICAL ENGINEERING, AUTOMOBILES.

Circuits.

See Voltage Regulation, under TRANSMISSION.

Fire Risks.

Electric Lighting and Fire Risks. Arthur Pordage. Read at the Fire Brig.

Off. Cong., London. Discusses fires due to electric currents and their causes. 1800 w. Archt, Lond—July 2, 1909. No. 6289 A.

Hand Lamps.

Lighting the Inside of Freight Cars during Loading (Innenbeleuchtung von Güterwagen während des Ladegeschäftes). D. Lasser. Describes electric hand lamps for connection with sockets set at intervals under the edge of the freight platform, etc. Ills. 2700 w. Glasers Ann—April 15, 1909. No. 5058 D.

Illumination.

The Theory and Practice of Illumination. Thomas W. Rolph. Discusses the purpose of illumination, the protection of the eye, the development of the science of illumination, and related subjects. 5000 w. Jour Fr Inst—May, 1909. No. 4762 D.

Modern Methods of Artificial Illumination. Leon Gaster. Introductory remarks with a discussion of types of glow lamps and arc lamps in the present number. Ills. 7500 w. Jour Soc of Arts—Aug. 6, 1909. Serial, 1st part. No. 7081 A.

The Work of the Illuminating Engineer. Donald Cameron Shafer. Reviews the achievements of illuminating engineering. Ills. 5000 w. Am Rev of Revs—Sept., 1909. No. 7785 N.

The Province of the Illuminating Engineer. Leon Gaster. Considers some of the more important problems in artificial lighting. 4500 w. Pub Works—Oct.-Dec., 1908. No. 3591 B.

The Mechanical Equivalent of Light. J. S. Dow. A résumé of this subject by C. V. Drysdale is reviewed and reference made to other investigators, and to the author's study. Also editorial. 4500 w. Elec Wld—Dec. 12, 1908. No. 927.

Indirect Illumination. Augustus D. Curtis. Illustrates and describes the successful use of tungsten lamps for indirect lighting. 1400 w. Cent Sta—Jan., 1909. No. 1655.

The Problem of Efficiency in Illumination. Arthur J. Sweet. Considers the conditions on which it depends. 3500 w. Elec Jour—March, 1909. No. 3202.

The Bearing of Modern Illumination Upon Physiological Optics. Sydney A. Ashe. A discussion of some of the relations of illumination to vision, particularly the relation of light-quality to visual acuity. Also editorial. 4000 w. Elec Wld—Feb. 25, 1909. No. 2871.

Color and Visual Acuity. J. S. Dow. Also editorial notes. Discusses difficulties met in illumination problems when

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dealing with colored lights. 6000 w. Elec Wld—July 15, 1909. No. 6339.

Graphical Determination of the Illumination of Horizontal Plane Surfaces (Graphische Bestimmung der Beleuchtung horizontaler Bodenflächen). Robert Edler. A detailed description of the methods. 3200 w. Elektrotech u Maschinenbau—March 28, 1909. No. 4289 D.

Why Laboratory Efficiency of a Light Source Differs From Efficiency of Illumination. A. L. Eustice. Shows that illumination efficiency depends on conditions as well as on the individual source of light. 1500 w. Elec Rev, N Y—May 29, 1909. No. 5167.

The Practical Solution of Lighting Problems (Les Solutions actuelles du Problème de l'Eclairage). H. Vigneron. A general discussion of the problems of illumination. Ills. Serial, 1st part. 2000 w. Tech Mod—Dec., 1908. No. 2632 D.

Spacing of Light Units. Alfred A. Wohlaer. Discusses relations of importance in connection with the spacing of light sources. 2000 w. Elec Wld—Sept. 16, 1909. No. 7775.

The Absorption-of-Light Method of Calculating Illumination. A. S. McAllister. Outlines the method. 1000 w. Elec Wld—Nov. 21, 1908. No. 340.

The Lighting of Reading Rooms: With Some Examples. P. Blagg. Criticises the work in English libraries, giving examples of good and bad arrangements. 2500 w. Elec Rev, Lond—Dec. 25, 1908. No. 1519 A.

Illumination Cost Factors. Max Harris. Explains methods used in figuring cost of illumination, discussing the factors to be considered. 3000 w. Elec Jour—June, 1909. No. 5547.

Design of Illuminating Installations Using Luminous Tubes. M. D. Cooper. A discussion of the relation existing between the rated candle-power of a tube lamp and the illumination upon a plane lighted by it. 3000 w. Elec Wld—Sept. 23, 1909. No. 8044.

The Effect of Various Maintenance Conditions on the Efficiency of Illumination. A. L. Eustice. Gives results of a recent study of commercial systems with special reference to this subject. 2500 w. Elec Age—Sept., 1909. No. 7842.

The Hudson-Fulton Celebration in New York City. Illustrates and describes some of the illuminating effects. 3000 w. Elec Wld—Sept. 30, 1909. No. 8249.

See also Shop Lighting, under MECHANICAL ENGINEERING, MACHINE WORKS AND FOUNDRIES.

Incandescent Lamps.

New Incandescent Lamps. Francis E. Cady. Discusses the new metallic filament lamps, their manufacture, physical and electrical properties, etc. 3000 w. Cent Sta—Dec., 1908. No. 934.

The Incandescent Electric Lamp. J. Findlay. Abstract of a paper read before the Rugby Engng Soc. Remarks on early patents, tests, rating, etc. 1500 w. Elect'n, Lond—Dec. 25, 1908. No. 1522 A.

The Progress of the Metallic Filament Lamp. Herbert T. Wade. A review of recent developments. 1500 w. Sci Am—June 5, 1909. No. 5355.

The Forerunners of the Metallic Filament Incandescent Lamp. Dr. C. Richard Böhm. Reviews the experiments made, with a view to utilize rare earths. 1200 w. Engr, Lond—Aug. 6, 1909. No. 7109 A.

Modern Incandescent Electric Lamps. A. C. Jolley. An account of tests at the photometric laboratory of the Northampton Inst., to obtain a fair comparison of the carbon filament and modern metallic filaments. 1200 w. Elect'n, Lond—Aug. 13, 1909. Serial, 1st part. No. 7311 A.

The Conservation of Our Natural Resources Through the Use of High Efficiency Lamps. S. E. Doane. Considers the great saving in fuel possible by a liberal replacement of carbon lamps by high-efficiency lamps. Also discusses rates. 5000 w. Cent Sta—Oct., 1909. No. 8451.

Metallic Filament Lamps. W. A. Barnes. Abstract of paper before the Manchester Assn. of Engrs. Describes types, giving detailed results of tests, and related information. 2500 w. Prac Engr—Jan. 15, 1909. Serial. 1st part. No. 2051 A.

Metallic-Filament Lamps. W. H. F. Murdock. Discusses their use on alternating current supply. 1000 w. Elec Rev, Lond—Jan. 22, 1909. No. 2205 A.

Some Modern Metal Filament Lamps and Fittings. Illustrated review of recent progress. 2500 w. Elect'n, Lond—Oct. 15, 1909. No. 8870 A.

Metallic Filament Lamps. W. H. Alabaster. Read before the Elec. Assn. of Victoria. Discusses their effect upon interior illumination. Also discussion. 8500 w. Aust Min Stand—Sept. 1, 8, and 22, 1909. Serial. 3 parts. No. 8826 each B.

The Luminous Efficiency of Metal Filament Lamps. W. W. Coblenz. Investigation of the factors producing this efficiency, especially the so-called radiation

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constant α . 1200 w. Elec Wld—Dec. 19, 1908. No. 1271.

High-Efficiency Lamp Renewal. J. F. Musselman, Jr. Compares the metallic-filament incandescent lamp with the carbon-filament type, from a standpoint of cost of energy and renewal. 1000 w. Elec Wld—Feb. 11, 1909. No. 2392.

A German View of the Future of the Metal-Filament Lamps. A summary of their position as compared with rivals, as given by H. Remané in the E. T. Z. 700 w. Elec Rev, Lond—Oct. 30, 1908. No. 184 A.

Radiation Constants of Metals. W. W. Coblentz. An investigation made to obtain some estimate of the emissivity of incandescent metal filaments. 11500 w. Bul Bureau of Stand—Feb., 1909. No. 3285 N.

The Influence of Metallic Filament Lamps on the Electrical Industry and on Street Lighting. E. E. Hoadley. Abstract of a paper read before the Incor. Munic. Elec. Assn. and of the discussion. Gives figures showing results in street lighting. 2000 w. Elect'n, Lond—June 25, 1909. No. 6274 A.

Results of Tests on Metallic-Filament Lamps at the Laboratoire Central d'Electricité (Résultats d'Essais effectués au Laboratoire central d'Electricité sur les Lampes à Filament métallique). F. Laporte. Results of various tests on nine types of metallic-filament lamp in use in Paris. Ills. 5200 w. Bul Soc Int d'Elecons—Feb., 1909. No. 3305 F.

The Actual Status of Metallic Filament Lamps (Etat actuel des Lampes à Incandescence à Filaments métalliques). A. Blondel. Reviews their history, the difficulties of their manufacture, their properties and the results obtained from their use. Ills. 10800 w. Bul Soc Int d'Elecons—Feb., 1909. No. 3304 F.

Power Characteristics of the Tungsten Filament. Charles P. Steinmetz. Reports an investigation of the manner in which the power consumption increases with increase of voltage. Also editorial note. 1200 w. Elec Wld—July 8, 1909. No. 6220.

Series Tungsten Lighting. Henry Schroeder. Abstract of a paper before the N.-W. Elec. Assn. Explains the advantages of tungsten lamps. 1800 w. Elec Rev, N Y—Feb. 27, 1909. No. 2856.

Experience with High-Efficiency Lamps in Industrial Plants. Warren H. Miller. Describes efforts made to use high-efficiency lamps in a big oil plant, showing the destruction to both tantalum and

tungsten lamps when exposed to vibration. Also editorial. 3000 w. Elec Wld—May 6, 1909. No. 5032.

Industrial Plant Illumination with Tungstens. Arthur Gillman. Illustrates and describes some methods whereby the difficulties inherent in tungsten lamps installed under factory conditions may be overcome. 1000 w. Elec Wld—Sept. 30, 1909. No. 8251.

The Installation of Tungsten Lamps for Factory Illumination. Arthur Gillman. Describes methods for damping filament-destroying vibrations, and other points relating to the installation of tungsten lamps. Ills. 2000 w. Elec Wld—Oct. 7, 1909. No. 8401.

Illumination of Shop Yards by Means of Tungsten Lamps. Arthur Gillman. Describes details of such installations. Ills. 700 w. Elec Wld—Oct. 14, 1909. No. 8559.

Tungsten Lamps Compared with Arc Lamps. Alton D. Adams. Advocating the use of tungsten lamps for street lighting. 2000 w. Munic Engng—April, 1909. No. 3817 C.

Practical Treatise on Tungsten and Carbon Lamps. H. D. Burnett. Showing by charts the results of a series of life tests. 4500 w. Can Elec News—June, 1909. No. 5466 C.

The Tungsten Lamp and Its Behavior on Life Tests as Compared With Carbon Lamps. H. D. Burnett. Discusses the objections to these lamps, their efficiency, and results of life tests, with matters related. General discussion. 14500 w. Can Soc of Civ Engrs, Bul 5—May, 1909. No. 5854 N.

Carbon-Filament and Tungsten Lamps (Ueber Kohlenfaden- und Wolframlampen). Al. Berninger. A comparison of efficiency. Ills. 3800 w. Elektrotech u Maschinenbau—June 27, 1909. No. 6719 D.

Investigations on 220-Volt Metallic-Filament Lamps (Versuche mit 220 voltigen Metallfadenlampen). Hr. Einberger. Gives results of tests in a series of curves. Ills. 2500 w. Zeitschr d Ver Deutscher Ing—Sept. 25, 1909. No. 8918 D.

Standard Lamp Screws of the German Electrical Association and Their Use in Practice (Die Normalgewinde des Verbandes Deutscher Elektrotechniker und ihre Anwendung in der Praxis). Paul A. Perls. A critical discussion. Ills. 3600 w. Elektrotech Zeitschr—Dec. 3, 1908. No. 2110 D.

Luminosity

See also Illumination, under LIGHTING; Shop Practice, under MECHANICAL ENGINEERING, MACHINE WORKS AND FOUNDRIES; and Tantalum, under MINING AND METALLURGY, MINOR MINERALS.

Luminosity.

Luminosity and Temperature. P. G. Nutting. An outline of the equations thus far developed and the most reliable constants that have been ascertained by careful investigation. 2000 w. Elec Wld—Sept. 23, 1909. No. 8043.

Mercury Arc.

White Light from the Mercury Arc and Its Complementary. Herbert E. Ives. A record of experimental investigations of the proper light source to be combined with the mercury arc to imitate average daylight. 2000 w. Elec Wld—Sept. 23, 1909. No. 8042.

Mercury-Vapor Lamps.

The Küch Quartz Mercury Vapor Lamp. O. Bechstein. Illustrated description of a lamp substituting quartz for glass. 1000 w. Sci Am Sup—Nov. 28, 1908. No. 476.

A New Carbon-Filament Mercury Vapor Lamp (Eine neue Kohlenfaden-Quecksilberlampe). Robert Hopfelt. Illustrated description and photometric curves. 3000 w. Elektrotech Zeitschr—Oct. 8, 1908. No. 609 B.

Photometric Units.

The Proposed International Unit of Candle Power. C. C. Paterson. Read before the *Phys. Soc.* A comparison of British, American, French and German units. 2800 w. Elect'n, Lond—Aug. 13, 1909. No. 7316 A.

Photometry.

Important International Agreement on Photometric Units. Reports an agreement between England, France and the United States upon a unit of candle-power of luminous intensity to be known as the international candle. 2000 w. Elec Wld—May 27, 1909. No. 5223.

The Determination of the Mean Spherical Intensity of a Source of Light. E. W. Weinbeer. Describes a slide-rule for its direct determination. 600 w. Elec Wld—Dec. 26, 1908. No. 1286.

Uniformity in the Photometry of Colored Light-Sources. F. E. Cady. Describes a scheme for overcoming difficulties by using standardized color screens. Also editorial. 3500 w. Elec Wld—July 22, 1909. No. 6615.

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A Tungsten Comparison Lamp in the Photometry of Carbon Lamps. Herbert E. Ives and L. R. Woodhull. Experience shows the Tungsten comparison lamp to be superior for the purpose to carbon lamps. 1200 w. Bull Bur of Stand—May, 1909. No. 6374 N.

An Experimental Study of the Globe Photometer. A. A. Perrine. Report of a study made in the laboratories of Armour Inst., Chicago. 1500 w. Elec Wld—Sept. 23, 1909. No. 8045.

See also Meters, under MEASUREMENT.

Progress.

Progress in Electric Current Development in the Artificial Lighting Field. Albert F. Ganz. An interesting review. 8200 w. Am Gas Lgt Jour—July 19, 1909. (Section 2.) No. 6405 N.

Progress in Electric Lighting. Gives details of the newer metallic filament lamps and their use for street lighting, a résumé of arc lamp development, and interesting fittings for both. Ills. 10000 w. Elect'n, Lond—Nov. 13, 1908. No. 437 A.

Recent Progress in Electric Lighting (Les Récents Progrès dans le Domaine de L'Eclairage Electrique). M. L. Flesch. A general review. Ills. Serial, 1st part. 3000 w. L'Electn—Oct. 24, 1908. No. 530 D.

Signal Lamps.

Electric Lighting of Railway Signal Lamps. A discussion of the advantages and methods. Ills. 1800 w. Elec Engr, Lond—May 7, 1909. No. 4716 A.

Street.

Some Principles of Street Illumination. Dr. Louis Bell. 2500 w. Elec Rev, N Y—March 13, 1909. No. 3129.

The Illumination of Streets. C. E. Stephens. Discusses the problem and the advantages of the incandescent lamp for outlying districts. 3000 w. Elec Jour—June, 1909. No. 5549.

New Methods and Specifications for Street Lighting. J. H. Perkins. Abstract of paper read before the Penn. Elec. Assn. Discusses the present and possible future trend in street illumination. 3500 w. Elec Rev, N Y—Oct. 2, 1909. No. 8309.

Street Lighting for Small Towns. J. R. Cravath. Deals principally with towns of 15000 population, or less. 4500 w. Elec Wld—Sept. 2, 1909. No. 7527.

Street Lighting in the Smaller Urban Districts. Edgar F. Willson. Read before the Inst. of Munic. Engrs. Discus-

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Street

sion. 4500 w. Surveyor. Feb. 12, 1909. No. 2587 A.

Ornamental Curb Line Illumination. D. F. Fradette. Describes decorative street lighting in the United States. Ills. 1500 w. Elec Rev, N Y—June 5, 1909. No. 5424.

Comparison of Gas Arcs, Flame Arcs and Series Tungsten Arches for Business-District Street-Lighting. H. W. Hillman. Favors the tungsten arch system. 1000 w. Elec Wld—April 22, 1909. No. 4440.

A Few Notes on American and European Street Lighting. H. Thurston Owens. A comparison, illustrating and describing fixtures, methods, etc., with suggestions. 2500 w. Eng News—Jan. 7, 1909. No. 1638.

Street-Lighting Conditions in Boston. An illustrated account of tests made and methods adopted under the contract of the Edison Electric Illuminating Co. 3500 w. Elec Wld—Sept. 2, 1909. No. 7528.

Street-Lighting Earnings in Massachusetts Cities. Gives street lighting comparisons for the year ending June 30, 1908, from returns submitted by a number of urban companies. 1200 w. Elec Wld—Oct. 21, 1909. No. 8811.

Illumination of Seventh Avenue, Manhattan Borough, New York City. Illustrates and describes the installation chosen after many tests; arc lamps being considered as best meeting the conditions. 1400 w. Elec Wld—Nov. 7, 1908. No. 94.

Viaduct Lighting in Kansas City.* Edwin R. Weeks. Describes the lighting by the tantalum lamp. 1600 w. Elec Wld—April 8, 1909. No. 4434.

MEASUREMENT

Dielectric Strength

Multiple Tungsten Street Lighting for Grinnell, Iowa. Describes the system adopted. 2000 w. Elec Wld—Oct. 14, 1909. No. 8560.

Recent Developments in the Street Lighting of Berlin, and a Comparison with Former Methods of Illumination. Dr. L. Bloch. A detailed comparison of the various methods now in use. 2500 w. Elect'n, Lond—Jan. 1, 1909. Serial. 1st part. No. 1701 A.

Street Lighting in Budapest. Francis Jehl. A brief account of an arc lamp trial circuit installed, which has been said to be one of the most perfect systems of street lighting yet invented. 1200 w. Elec Wld—Oct. 21, 1909. No. 8810.

Street Lighting in Rio de Janeiro. A. H. Keleher. An illustrated article describing the lighting of important thoroughfares. 1200 w. Elec Wld—Feb. 11, 1909. No. 2390.

See also Incandescent Lamps, under LIGHTING.

Theatres.

Regulators for Stage Lighting (Bühnenregulatoren). V. Paetow. Illustrated description of various types of dimmers. 5000 w. Elektrotech Zeitschr—Oct. 22, 1908. No. 613 E.

Train.

See Train Lighting, under RAILWAY ENGINEERING, MOTIVE POWER AND EQUIPMENT.

Transformers.

Metallic-Filament Lamp Transformers. L. Crouch. Deals with considerations regarding their technology and economics. Ills. 2000 w. Elec Rev, Lond—Sept. 3, 1909. Serial. 1st part. No. 7727 A.

MEASUREMENT

Alternating Current.

Measurement of Alternating Current Energy. M. A. Sammett. Considers briefly the necessity for selection of proper current and potential transformers, effects of phase displacements and power factor. 1200 w. Can Elec News—June, 1909. No. 5467 C.

Barometer.

An Electrical Barometer (Un Baromètre électrique). Robert Goldschmidt. Illustrated description. Ills. 1500 w. Soc Belge d'Elecn—Oct., 1908. No. 509 E.

Capacity.

Measurement of Capacity and Self Induction (Etalonnement des Capacités et

des Self-Inductions). MM. Decoin and Devaux-Charbonnel. Describes a simple method and apparatus used by the authors. Ills. 3000 w. L'Elecn—July 10, 1909. No. 7219 D.

Dielectric Strength.

On Testing the Insulation Resistance of Live Cables on Direct-Current Systems. R. G. Allen. Abstract of paper before the Inst. of Elec. Engrs. at Dublin. An explanation of method used. 1200 w. Elec Rev, Lond—April 16, 1909. No. 4192 A.

The Measurement of the Insulation Resistance of a Live Three-Wire System. Gisbert Kapp and Dennis Coales. Abstract

ELECTRICAL ENGINEERING

Dynamo Testing

of paper accepted by the Inst. of Elec. Engrs. Describes methods of finding the joint fault resistance, and a method whereby the insulation of each wire may be ascertained separately. 1000 w. Elect'n, Lond—May 7, 1909. No. 4721 A.

Dynamo Testing.

. Efficient Test of Three-Wire Balancing Dynamos. J. W. Hemmelsbach. Describes test of two a. c. generators forming a balancing set on a three-wire 250 volt system. Ills. 1100 w. Power—June 8, 1909. No. 5319.

The Testing of Alternators. S. P. Smith. Abstract of a paper before the Birmingham Loc. Sec. of the Inst. of Elec. Engrs. Shows the incorrectness of existing methods and explains an accurate method. 2200 w. Elect'n, Lond—Nov. 13, 1908. No. 436 A.

The Testing of Alternators. Stanley P. Smith. Abstract of paper before the Birmingham Sec. of the Inst. of Elec. Engrs. Discusses methods and their defects. 3500 w. Elec Engr, Lond—Nov. 27, 1908. No. 859 A.

The Kapp-Hopkinson Test on a Single Direct-Current Machine. Dr. W. Lulofs. Read before the Birmingham Sec. of the Inst. of Elec. Engrs. Shows how this test may be adapted on a single lapwound d. c. machine, provided it is not supplied with Mordey equalizing connections. 3000 w. Elec Engr, Lond—Feb. 26, 1909. Serial. 1st part. No. 3050 A.

The Kapp-Hopkinson Test on a Single Direct-Current Machine. Dr. W. Lulofs. Shows how the Kapp-Hopkinson test may be adapted for a single lapwound, direct-current machine, provided it is not supplied with Mordey equalizing connections. 1200 w. Elect'n, Lond—Feb. 12, 1909. No. 2582 A.

On a Method of Using Transformers as Choking Coils and Its Application to the Testing of Alternators. J. D. Coales. Abstract of a paper read before the Birmingham Loc. Sec. of Inst. of Elec. Engrs. Describes the method and its application. 1800 w. Elect'n, Lond—Dec. 25, 1908. No. 1521 A.

The Practical Testing of Dynamos and Motors. H. E. Mellor. Read before the Owens College Engng. Soc. States principles, describing tests for short circuits, bad connections, etc., in armatures for d. c. machines; stators for induction motors, alternators, synchronous motors; rotors for induction motors; magnet coils for d. c. machines and alternators. 4500 w. Mech Engr—Nov. 27, 1908. No. 856 A.

MEASUREMENT

Galvanometers

The Influence of Shaft Twist on the Measurement of Irregularity Factors. Mathematical explanation given by Moritz Kroll, in *Elektrotechnik und Maschinenbau*. 1000 w. Elec Engr, Lond—Nov 6, 1908. No. 309 A.

The Testing of Electrical Machinery (La Prova delle Macchine elettriche). F. Loppe. The first part being a discussion of tests of the materials and construction of the machines. Serial. 1st part. 2500 w. Elettrocita—March 25, 1909. No. 4240 D.

Eddy-Current Loss.

See Hysteresis, under MEASUREMENT.

Electrodynamometers.

A New Absolute Electrodynamometer and the Determination of the Electromotive Force of a Weston Cell (Nouvel Electrodynamomètre absolu et Détermination de la Force électromotrice de l'Élément du Type Weston). H. Pellat. Report from the Laboratoire central d'Electricité. Ills. 21000 w. Bul Soc Int d Elecns—Aug.-Oct., 1908. No. 1106 F.

Determination of the Constant of an Absolute Electrodynamometer by an Induction Phenomenon (Détermination de la Constante d'un Electrodynamomètre absolu par un Phénomène d'Induction). A. Guillet. Report from the Laboratoire central d'Electricité. Describes the Lippmann method, the apparatus and calculations involved and the application of the results to the determination of the electromotive force of a cadmium cell. Ills. 9000 w. Bul Soc Int d Elecns—Aug.-Oct., 1908. No. 1104 F.

See also Standard Cells, under MEASUREMENT.

Electrometer.

A String Electrometer. T. H. Laby. Abstracted from Pro. of Cambridge Phil. Soc. Describes a simple form of string electrometer and tests made. 800 w. Elect'n, Lond—Aug. 20, 1909. No. 7490 A.

Frequency.

Stroboscopic Measurements of Alternating-Current Frequency with Electric Lamps. A. E. Kennelly. An account of measurements to about one-tenth of 1 per cent, with no other apparatus than a permanent magnet and an incandescent lamp, with the aid of a stroboscopic fork. 1500 w. Elec Wld—Dec. 26, 1908. No. 1284.

Galvanometers.

A Convenient Form of Galvanometer with Magnetic Shielding. E. F. Nichols and S. R. Williams. Abbreviated from

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High Frequency Currents

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Insulation

Phys Rev. Detailed description. Diagram. 1500 w. *Elect'n, Lond*—April 9, 1909. No. 4026 A.

Calibration of a Ballistic Galvanometer. C. M. Jansky. Points out the fallacy of methods given in some handbooks, and the reason for the inaccuracy. 500 w. *Elec Wld*—April 8, 1909. No. 4431.

A Bifilar Vibration Galvanometer. W. Duddell. Abstract of a paper read before the *Phys. Soc.* A new type and a series of tests made upon it are described. 1500 w. *Elect'n, Lond*—July 30, 1909. No. 6977 A.

High-Frequency Currents.

Apparatus for the Measurement of Telephone Currents and, in General, All Weak Currents of Very High Frequency (*Appareil pour la Mesure des Courants téléphoniques et, en Général, des Courants périodiques de grande Fréquence et de très faible Intensité*). Riccardo Arno. Illustrated description. 3500 w. *Bul Soc Int des Elecs*—April, 1909. No. 4816 F.

Hysteresis.

Experimental Determination of the Hysteretic Exponent. Nicholas Stahl. Shows how the hysteretic exponent may be evaluated. 500 w. *Elec Wld*—Nov. 21, 1908. No. 339.

Errors in Magnetic Testing with Ring Specimens. Morton G. Lloyd. The methods of determining the hysteresis of a ring specimen are considered and the energy losses calculated. 2500 w. *Bul Bureau of Stand*—Feb., 1909. No. 3288 N.

Magnetic Testing of Iron with Alternating Current. Albert Campbell. Describes the method by which tests for hysteresis and eddy current loss are carried out at the *Nat. Phys. Laboratory*, and gives some of the results. 3000 w. *Elec Engr, Lond*—Sept. 24, 1909. No. 8339 A.

Hysteresis Loss.

Differential Testing for Hysteresis Loss. Ernest Wilson. A report of experimental investigations. 1000 w. *Elect'n, Lond*—July 23, 1909. No. 6836 A.

Inductance.

A Simple Means of Measuring Inductances. C. J. Watson. Describes apparatus consisting of a kind of Wheatstone bridge in which two inductances are balanced against two capacities. 1000 w. *Elect'n, Lond*—March 5, 1909. No. 3154 A.

Instruments.

Measurements with Portable Instruments. F. P. Cox. Comments on con-

ditions that influence such measurements, causes of error, accuracy, etc. 4000 w. *Elec Age*—Oct., 1908. No. 49.

Electrical Measuring Instruments for Direct Current and Their Use. R. M. Phinney. Discusses the measurement of pressure, current, resistance, and power. 3000 w. *Sig Engr*—Sept., 1909. No. 7828.

Electrical Measuring Instruments and Some of Their Weaknesses. Kenelm Edgcumbe. Discusses points to be considered in selecting an instrument, the question of accuracy, etc. 5500 w. *Pub Works*—Oct.-Dec., 1908. No. 3593 B.

Temperature Errors in Shunted Ammeters. W. Fennell. Discusses errors due to changes of temperature, and also other causes of error. 1400 w. *Elec Rev, Lond*—June 25, 1909. No. 6273 A.

Ohmmeters and a New Universal Apparatus for the Direct Reading of Volts, Amperes and Ohms (*Ueber Ohmmeter und einen neuen Universalapparat, der Spannung, Stromstärke und den Widerstand direkt abzulesen gestattet*). Egon Siedek. Illustrated description. *Elektrotech u Maschinenbau*—July 18, 1909. No. 7464 D.

Alternating-Current Instruments. Paul MacGahan. The present article gives an illustrated description of disc type induction ammeters and voltmeters, their construction and operation. 1800 w. *Elec Jour*—Jan., 1909. Serial. 1st part. No. 1845.

Three-Phase Switchboard Instruments. E. P. Peck. Discusses the instruments necessary for showing the important factors. 2000 w. *Elec Wld*—Nov. 14, 1908. No. 228.

Ammeter for the Accurate Measurement of Large Alternating Currents. E. F. Northrup. Discusses the laws governing the pressure in a conductor of circular cross-section conveying on electric current, and describes an ammeter based on the variation of the pressure in a liquid conductor. 3500 w. *Elect'n, Lond*—Oct. 1, 1909. No. 8488 A.

Hot-Wire Ammeter for Currents of High Frequency and Tension (*Ampère-mètre thermique pour Courants de forte Intensité et de grande Fréquence*). M. Broca. Illustrated description of an invention of the author. 1400 w. *Bul Soc Int des Elecs*—July, 1909. No. 7207 F.

See also Switchboards, under GENERATING STATIONS.

Insulation.

The Measurement of the Insulation of a Live Three-Wire System. Stuart A. Russell. Describes Prof. Rousseau's

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Insulation Testing

method. 500 w. Elec Rev, Lond—Sept. 17, 1909. No. 8111 A.

Insulation Testing.

Insulation Testing. E. M. Wood. Deals with tests made to determine if the insulation is sufficient for safe use. 3000 w. Ap Sci—Jan., 1909. No. 2094 C.

The Use of Dielectrics and the Principal Tests Applied to Them. T. Germann and S. M. Hills. Extract of paper read before the Jun. Inst. of Engrs. Discusses the properties of insulating materials and the necessary tests, giving particulars of a new method of testing. 3300 w. Elect'n, Lond—May 14, 1909. No. 4944 A.

On Testing the Insulation Resistance of Live Cables on Direct-Current Systems by the Kelvin Testing Set. R. G. Allen. Abstract of paper read before the Dublin Sec. of the Inst of Elec. Engrs. Describes method. Diagrams. 800 w. Elect'n, Lond—July 16, 1909. No. 6669 A.

See also Dielectric Strength, under MEASUREMENT.

Iron Losses.

A Method of Measuring Iron Losses in Bundles of Straight Strips. Robert Beattie. Describes experiments made to determine whether the wattmeter method proposed would work with short specimens. 3000 w. Elect'n, Lond—Nov. 6, 1908. No. 314 A.

Laboratories.

The New Laboratory of the Electrical Engineering Department at the Ohio State University. F. C. Caldwell. Illustrated detailed description of the building and its equipment. 3000 w. Ohio Soc of Mech, Elec, & Steam Engrs, No. 146—Nov., 1908. No. 908 N.

The New Electric Laboratory Equipment of the City of Philadelphia. Illustrated description. 1500 w. Elec Rev, N Y—April 3, 1909. No. 3749.

The National Physical Laboratory in 1908. Editorial review of progress in all departments. 4000 w. Engng—March 26, 1909. Serial. 1st part. No. 3787 A.

Electrical Work at the Physikalisch-Technische Reichsanstalt in 1908. Gives a summary of the work in the electrical department during the year. 2000 w. Elect'n, Lond—Aug. 27, 1909. No. 7648 A.

See also Education, under INDUSTRIAL ECONOMY.

Magnetic Testing.

Errors in Magnetic Testing with Ring Specimens. M. G. Lloyd. Discusses the inaccuracy of the apparent values of mean gilberts per centimeter, and of the mean

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Meters

hysteretic power obtained from ring test pieces, owing to the differences of perimeter at the inside and outside of the ring. Gives a correction factor. 1500 w. Elec Wld—Dec. 26, 1908. No. 1285.

Meter Connections.

Connections for a Single-Phase Wattmeter on a Three-Phase, Three-Wire System. F. Conrad. Explains two methods in general use. Diagrams. 1800 w. Elec Wld—Aug. 19, 1909. No. 7173.

Meters.

Meters. Burleigh Currier. An elementary explanation of their underlying principles and methods of testing. 6500 w. Elec Age—July, 1909. Serial, 1st part. No. 6917.

Value of the Care and Maintenance of Meters. H. D. King. Abstract of a paper read before the Nat. Elec. Lgt. Assn. Gives results of tests made of meters. 1000 w. Elect'n, Lond—Dec. 25, 1908. No. 1527 A.

A Volt Scale for a Watts-Per-Candle Meter. Herbert E. Ives. Describes a method of applying a direct-reading scale to a specific consumption photometer. 1500 w. Elec Wld—March 25, 1909. No. 3512.

A Volt Scale for a Watts-per-Candle Meter. Herbert E. Ives. Describes an efficiency-meter volt scale and its use. 1500 w. Bul Bureau of Stand—May, 1909. No. 6372 N.

Mercury Motor Continuous-Current Electricity Meters. Rankin Kennedy. A résumé of the different stages of development in this class of instrument. 1000 w. Elec Rev, Lond—June 18, 1909. No. 6029 A.

The Effects of Short-Circuits on Watt-Hour Meters. A. L. Goetz. An account of experiments made and conclusions. Ills. 1200 w. Transit—June, 1909. No. 6479 N.

The Effect of Short Circuits on Watt-Hour Meters. A. L. Goetz. Graduation thesis. A report of experimental investigations and conclusions. 1200 w. Am Gas Lgt Jour—Aug. 9, 1909. No. 6931.

The Performance of Electricity Meters under Fluctuating Load (Ueber das Verhalten von Elektrizitätszählern bei schwankender Belastung). E. Orlich and Günther-Schulze. Shows that fluctuations in load have no effect on the accuracy of the meter. Ills. 2000 w. Elektrotech u Maschinenbau—Aug. 29, 1909. No. 7995 D.

The Measurement of Energy in Single-Phase Three-Wire Systems (Energie-messung in Wechselstrom-Dreileiteran-

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Meter Testing

lagen durch Elektrizitätsmesser). Rudolf Kopp. Shows the use of the induction meter for this purpose. Mathematical. Ills. 3700 w. *Elektrotech Zeitschr*—Nov. 12, 1908. No. 1301 B.

See also Shop Practice, under MECHANICAL ENGINEERING. MACHINE WORKS AND FOUNDRIES.

Meter Testing.

Testing Electric Meters. From a paper, by Frank A. Vaughn, read before the N.-W. Elec. Assn., giving an account of the measures adopted at Milwaukee to meet the requirements of the Wisconsin public service commission. 1800 w. *Elec Wld*—Jan. 28, 1909. No. 2128.

Testing and Adjusting Watt-Hour Meters. O. F. Dubruiel. Gives practical methods of handling Westinghouse instruments, with wiring diagrams. 1500 w. *Power*—Jan. 5, 1909. (Special No.) No. 1481 D.

Tests of Watt-Hour Meters. Report prepared by Dr. Cary T. Hutchinson on tests of direct and alternating-current watt-hour meters of the type used in New York City. 3000 w. *Elec Wld*—April 29, 1909. No. 4486.

Importance of Testing Meters. H. W. Richardson. Gives instances illustrating the benefits derived from metering, and shows the necessity of testing the meters. 2500 w. *Elec Wld*—Sept. 2, 1909. No. 7529.

Some Notes on Meter-Room Practice. Discusses the organization, work, and testing of the meter department of a central station. 1300 w. *Elec Engr*, Lond—May 28, 1909. No. 5413 A.

The Use of a Phase-Shifting Transformer for Wattmeter and Supply Meter Testing. C. V. Drysdale. An illustrated description of the instrument and its use. 1500 w. *Elect'n*, Lond—Dec. 11, 1908. No. 1210 A.

Motor Testing.

A Special Brake and Mechanism for Recording the Mechanical Output of a Motor. A. H. Forman. Illustrates and describes an apparatus which gives quite accurate results. 1500 w. *Sibley Jour of Engng*—April, 1909. No. 5103 C.

The Efficiency of Asynchronous Machines Tested by the Loading-Back Method. Stanley P. Smith. Describes a new application of the no-load and zero-speed circle diagram. Also editorial. 3500 w. *Elec Wld*—June 17, 1909. No. 5572.

See also Dynamo Testing, under MEASUREMENT; and Induction Motors, under DYNAMOS AND MOTORS.

MEASUREMENT

Oscillographs.

The Oscillograph. A. H. Forman. Brief discussion of examples of three general types. 2000 w. *Sib Jour of Engng*—Nov., 1908. No. 835 C.

Photometry.

See same title, under LIGHTING.

Potentiometers.

The Use of the Potentiometer on Alternate-Current Circuits. Charles V. Drysdale. Discusses the application of the potentiometer principle to a. c. measurements and describes the use of the author's phase-shifting transformer with a potentiometer. 1200 w. *Elect'n*, Lond—April 16, 1909. No. 4194 A.

Power Factor.

Deduction of the Power Factor in Balanced Three-Phase Circuits from Wattmeter Readings (*Deduzione del Fattore di Potenza di un Circuito trifase equilibrato dalle Indicazioni dei Wattmetri*). Angelo Barbagelata. A mathematical demonstration of the method. Ills. 3600 w. *Elettricità*—Dec. 3, 1908. No. 1937 D.

Resistance.

The Construction and Measurement of High Resistance. Howard L. Bronson. Condensation of paper presented before the Am. Elec. Chem. Soc. Reports a study of this problem, and the difficulties. 2500 w. *Elec Rev*, N Y—Nov. 14, 1908. No. 277.

A New Method for the Absolute Measurement of Resistance. Edward B. Rosa. Describes a new revolving coil method, explaining its advantages. Ills. 2500 w. *Bul Bureau of Stand*—May, 1909. No. 6370 N.

Non-Inductive, Water-Cooled Standard Resistances for Precision Alternating-Current Measurements. C. C. Patterson and E. H. Rayner. Abstract of paper to the Inst. of Elec. Engrs. Gives method of measuring resistances of low value and up to any current capacity. Ills. 2000 w. *Elect'n*, Lond—April 16, 1909. No. 4195 A.

Notes on Three Methods of Electrical Measurement (*A propos de trois Méthodes de Mesures électriques*). M. Bouffart. Discusses the measurement of the resistance of a galvanometer by the method of equal deviation, the e. m. f. of a cell by the Poggendorff method, and the internal resistance of a cell by the Mance method. Ills. 3500 w. *Bul Sci de l'Assn des Elèves*—Feb., 1909. No. 4205 D.

Rheograph.

Application of the Rheograph to the

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Self-Induction

Study of Various Phenomena (Application du Rhéographe à l'Etude de Divers Phénomènes). Henri Abraham. Description of the construction and uses of this curve-tracing device devised by Abraham and Charpentier. Ills. 5000 w. Bul Soc Int des Elecns—July, 1909. No. 7210 F.

Self-Induction.

See Capacity, under MEASUREMENT.

Slip.

The Asynchronometer, a New Machine for Measuring Slip (Das Asynchronometer, ein neuer Schlüpfungsmesser). Felix Horschitz. Illustrated description of its construction and use. 2200 w. Elek Kraft u Bahnen—Aug. 24, 1909. No. 7991 D.

Speed.

The Development of Electrical Speed-Measuring Instruments (Die Entwicklung der elektrischen Fahrgeschwindigkeitsmessung). Paul Bautze. Illustrated description of types for railroads and automobiles. 5500 w. Elektrotech Zeitschr—Oct. 15, 1908. No. 610 B.

Standard Cells.

The Standard Electrical Cell—Its Use and Its Practical Value. Herbert T. Wade. Information concerning the forms of cells used and their agreement. Ills. 1500 w. Sci Am—July 10, 1909. No. 6239.

The Temperature Formula of the Weston Standard Cell. F. A. Wolff. Describes investigations made, discussing results and stating conclusions. 7500 w. Bul Bureau of Stand—Nov., 1908. No. 1349 N.

The Standard Cadmium Cell (L'Élément étalon au Cadmium). P. Janet and R. Jonaust. Report from the Laboratoire central d'Electricité. A general discussion and results of researches. Ills. 16000 w. Bul Soc Int d Elecns—Aug.-Oct., 1908. No. 1101 F.

Determination by an Absolute Electrodynamometer of the Electromotive Force of Cadmium Cells (Détermination par un Electrodynamomètre absolu de la Force électromotrice des Éléments au Cadmium). P. Janet, F. Laporte and R. Jonaust. Report from the Laboratoire central d'Electricité. Describes the instrument and methods of tests and gives results. Ills. 18000 w. Bul Soc Int d'Elecns—Aug.-Oct., 1908. No. 1102 F.

See also Electrodynamometers, under MEASUREMENT.

Standards.

The Construction of Standards of the International Ohm (Note sur la Construc-

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Units

tion d'Etalons de l'Ohm international). J.-René Benoit. Report from the Laboratoire central d'Electricité. Describes the method. 3300 w. Bul Soc Int d'Elecns—Aug.-Oct., 1908. No. 1105 F.

See also Units, under MEASUREMENT.

Stray Flux.

The Determination of Stray Flux in Alternating-Current Windings (Beitrag zur Bestimmung der Streuung von Wechselstromwicklungen). M. Schenkel. Describes and discusses mathematically a method of measurement. Ills. 5200 w. Elektrotech u Maschinenbau—Feb. 28, 1909. No. 3558 D.

Transformer Testing.

Some Practical Notes on Transformer Testing. E. M. Wood. Notes based on experience of various methods. 2,000 w. Can Elec News—Nov., 1908. No. 223.

Testing of Transformers in Central Stations. Omer F. Dubruel. Presents methods of testing which will assist operators in testing transformers of any make. 3500 w. Elec Rev, N Y—May 29, 1909. No. 5165.

Method of Testing Transformer Core Losses, Giving Sine-Wave Results on Commercial Circuits. L. W. Chubb. Describes an instrument termed an iron-loss voltmeter, dealing in detail with transformer core-loss tests. Ills. 3000 w. Pro Am Inst of Elec Engrs—July, 1909. No. 6489 F.

Units.

The Actual Situation of the Metric System (La Situation actuelle du Système métrique). Ch.-Ed. Guillaume. A discussion of the laws defining the fundamental metric units. 5200 w. Bul Soc Int d'Elecns—Jan., 1909. No. 2614 F.

The Principles Involved in the Selection and Definition of the Fundamental Electric Units to Be Proposed for International Adoption. F. A. Wolff. 6500 w. Bul Bureau of Stand—Nov., 1908. No. 1347 N.

Electrical Units and Standards (Unités et Etalons électriques). M. Devaux-Charbonnel. Discusses the problems to be solved in devising an international system. 6000 w. L'Elec—Dec. 12, 1908. No. 1921 D.

A Note on Mechanical and Electrical Units (Note sur les Unités mécaniques et électriques). A discussion of the various systems. Serial, 1st part. 2000 w. L'Elec—Jan. 23, 1909. No. 2631 D.

Some Reflections on Systems of Units (Quelques Reflexions sur les Systèmes de Mesure). M. Brylinski. Compares the

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Units

metric and C. G. S. systems showing that the latter is simply a modification of the former. Discussion. 8400 w. Bul Soc Int d'Elecn—Jan., 1909. No. 2613 F.

Remarks on the Systems of Units (Remarques sur les Systèmes d'Unités). D. Berthelot. Principally a discussion of M. Brylinski's paper. 7400 w. Bul Soc Int d'Elecn—Feb., 1909. No. 3303 F.

Notes on the Electromagnetic System (Quelques Réflexions au Sujet de Système électromagnétique). M. Pellat. A discussion of M. Berthelot's paper on systems of units. Ills. 2500 w. Bul Soc Int d'Elecn—March, 1909. No. 4208 F.

POWER APPLICATION

Machine Tools

The Mercury Ohm. Shows the needless complications introduced by the present definition of the ohm, suggesting the amendment. 1500 w. Prac Engr—Nov. 6, 1908. No. 302 A.

Wheatstone Bridge.

A Source of Error in Measurements with the Alternating-Current Bridge (Ueber eine Fehlerquelle bei Messungen mit der Wechselstrombrücke). Herr Behne. Mathematical discussion of the effect of the possible capacity of the bridge arms against earth. Ills. 3000 w. Elektrotech u Maschinenbau—Sept. 19, 1909. No. 8902 D.

POWER APPLICATION

Agriculture.

Power from the Farm Brook. Donald Cameron Shafer. An illustrated account of the possible uses to be made of electric power generated. 4000 w. Am Rev of Revs—Jan., 1909. No. 1737 C.

Applications of Electricity in Agriculture (Aplicaciones de la Electricidad á la Agricultura). D. Hermenegildo Gorria. A general review. Serial. 1st part. 4000 w. Energia Elec—Nov. 10, 1908. No. 1139 D.

See also Isolated Plants, under GENERATING STATIONS.

Air Compressors.

See Air Compressors, and Turbo-Compressors, under MECHANICAL ENGINEERING, POWER AND TRANSMISSION.

Alternating Currents.

Alternating Currents and Reciprocating Movements (Appareils et Machines á Courant et Mouvement alternatifs). P. Boucherot. Discusses the possibility of producing reciprocating movements directly from the alternations in a. c. circuits without utilizing rotary motion. Ills. 7500 w. Bul Soc Int des Elecn—Dec., 1908. No. 1907 F.

Blowing Engines.

See same title, under MINING AND METALLURGY, IRON AND STEEL.

Brakes.

See same title, under MECHANICAL ENGINEERING, MACHINE ELEMENTS AND DESIGN.

Cranes.

See Crane Trolleys, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING.

Dry Docks.

Electricity Applied to a Tyneside Dry Dock. Illustrated description of an up-to-date example of electrical equipment in shipyard work. 2500 w. Elec Rev, Lond—Oct. 23, 1908. No. 71 A.

Elevators.

See same title, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING.

Heating.

Electric Heating. W. S. Hadaway, Jr. Considers the practical adaptability of commercial electricity for heating purposes and for performing useful work. Also discussion. 10500 w. Pro Am Inst of Elec Engrs—Feb., 1909. No. 2420 F.

Commercial Electric Heating. John Roberts. Considers a change in methods of distribution necessary and gives suggestions. 3500 w. Inst of Elec Engrs—Nov. 26, 1908. No. 864 N.

Notes on Radiators. Gives tabulated results of experiments to determine the efficiency, with related information. 1800 w. Elec Rev, Lond—May 7, 1909. No. 4668 A.

See also Economics, under GENERATING STATIONS.

Hoisting.

See Electric Hoisting, under MINING AND METALLURGY, MINING.

Lock Gates.

See Locks, under CIVIL ENGINEERING, WATERWAYS AND HARBORS.

Machine Tools.

See Electrical Driving, under MECHANICAL ENGINEERING, POWER AND TRANSMISSION.

ELECTRICAL ENGINEERING

Marine Propulsion

POWER APPLICATION

Welding

Marine Propulsion.

See Electric Power, under MARINE AND NAVAL ENGINEERING.

Marseilles Congress.

The International Congress on the Applications of Electricity (Le Congrès international des Applications de l'Electricité). Paul Janet. A general outline of the proceedings. 7200 w. Rev Gen d Sci—Nov. 30, 1908. No. 1113 D.

Mining.

See Electric Power, under MINING AND METALLURGY. COAL AND COKE, and under MINING.

Observatory.

Electricity at Harvard College Observatory. Howard S. Knowlton. Illustrates and describes the many applications at the observatory. 2500 w. Elec Wld—June 24, 1909. No. 5890.

Power Contracts.

Analysis of Proposed Change in Power Contract. Robert Sibley. Gives the proposed contract, showing that there is an increased expenditure due to unity power factor clause and peak load penalties. 2200 w. Eng & Min Jour—April 17, 1909. No. 4006.

Printing Presses.

Two-Motor-Drive Web Printing Press, Manual Control. S. H. Sharpsteen. Discusses the essentials of web-press equipment. 3000 w. Elec Rev, N Y—Nov. 7, 1908. No. 156.

See also Electric Driving, under MECHANICAL ENGINEERING, POWER AND TRANSMISSION.

Progress.

Recent Progress in the Applications of Electricity (Le Mouvement Récent des Grandes Applications de l'Electricité). Maurice Levy. Reviews progress in methods of transmission and utilization of electrical energy. 3500 w. Rev Gen d Sci—Oct. 15, 1908. No. 522 D.

Pumping.

See Electric Pumping, under MECHANICAL ENGINEERING, HYDRAULIC MACHINERY.

Refrigerating Machines.

See Refrigeration, under MECHANICAL ENGINEERING, HEATING AND COOLING.

Regulations

Police Regulations Governing the Installation, Operation and Supervision of Electrical Plants (Polizeiverordnung betreffend Einrichtung, Betrieb und Ueberwachung elektrischer Starkstromanlagen). Proposed by representatives of the German Assn. of Elec. Engrs. as alternative to the regulations of the Prussian Department of Commerce. Ills. 5000 w. Elektrotech Zeitschr—Oct. 15, 1908. No. 611 B.

Rolling Mills.

Electrically-Driven Brass and Copper Rolling Mills. C. A. Ablett. Abstract of paper read before the Birmingham Assn. of Mech. Engrs. An account of methods of driving such mills, describing a typical installation. 4500 w. Ir & Coal Trds Rev—Nov. 13, 1908. No. 459 A.

See also same title, under MINING AND METALLURGY, IRON AND STEEL.

Shipboard.

See Electric Power, under MARINE AND NAVAL ENGINEERING.

Ships.

See Electric Power, under MARINE AND NAVAL ENGINEERING.

Steel Works.

See same title, under MINING AND METALLURGY, IRON AND STEEL.

Textile Mills.

Electrical Driving in Cotton Mills. W. H. Booth. An investigation of some of the misconceptions in respect to turning moments. 2500 w. Elec Rev, Lond—Nov. 13, 1908. Serial, 1st part. No. 435 A.

See Electric Driving, under MECHANICAL ENGINEERING, POWER AND TRANSMISSION.

Theatres.

Electricity in the Production of "Joan of Arc." Brief account of the many uses made of electricity in the recent presentation at the Harvard Stadium. 1000 w. Elec Wld—June 24, 1909. No. 5889.

Water Softening.

See Softening, under CIVIL ENGINEERING, WATER SUPPLY.

Welding.

See same title, under MECHANICAL ENGINEERING, MACHINE WORKS AND FOUNDRIES.

Alternating Currents.

The Development of an Alternating-Current Distributing System. H. B. Gear. Discusses problems common to the development of all a. c. systems and also some special cases. Discussion. Ills. 7000 w. Jour W Soc of Engrs—Dec., 1908. No. 1858 D.

Graphical Diagram for Power in an Alternating-Current Circuit. J. Irving Brewer. An explanation of its construction. 1200 w. Elec Wld—Jan. 21, 1909. No. 1871.

Charts for the Calculation of Alternating Current Circuits. H. P. Liversidge. Gives charts and describes their use for the solution of various problems. 1000 w. Power—Sept. 14, 1909. No. 7721.

Balancing.

The Balancing of a Three-Wire Direct-Current Network. B. Sankey. Suggestions from the writer's experience, describing a successful system. 600 w. Elec Rev, Lond—Jan. 1, 1909. No. 1694 A.

Cable Drawing.

The Use of Fish Wire in Conduit Work. Arthur Gillman. Discusses "fishing" the conduit, and the fastening of the fishing wire to the electrical conductors, or to a pulling-line. 1500 w. Elec Wld—June 24, 1909. No. 5893.

See also Conduits, under TRANSMISSION.

Cable Laying.

Two Useful Cable-Laying Appliances. C. A. Smith. Brief illustrated descriptions of a cable drum carriage, and a special duct reel, made by the writer. 700 w. Elec Rev, Lond—Aug. 20, 1909. No. 7434 A.

Cable Records.

Plans and Records for Electrical Distribution Systems. J. W. Beauchamp. Abstract of a paper before the Leeds Loc. Sec. of the Inst. of Elec. Engrs. Describes the system of mains, records used by the Sheffield Corporation. Diagrams. 1200 w. Elect'n, Lond—Jan. 1, 1909. No. 1697 A.

Cables.

The Resistance and Reactance of Armored Cables. J. B. Whitehead. Gives calculations showing that even at 60 cycles, and with outgoing and return cables placed close together, the reactance would not be serious. 2500 w. Pro Am Inst of Elec Engrs—June, 1909. No. 5830 F.

Losses, Induced Volts and Amperes in Armor and Lead Cover of Cables. H. W. Fisher. Supplementary to J. B. Whitehead's paper, presenting data obtained from measurements made on the same cables. Also further tests. 800 w. Pro Am Inst of Elec Engrs—Aug., 1909. No. 7062 F.

Surges on a Cable System with an Aluminum Surge Protector. E. E. F. Creighton and S. D. Sprong. Experimental investigation of the surges on an underground alternating current distribution system, and the protection by aluminum cells. 5500 w. Pro Am Inst of Elec Engrs—July, 1909. No. 6491 F.

Discussion on "Surges on Cable Systems with Aluminum Cell Protection." The paper by E. E. F. Creighton and S. D. Strong is discussed at Frontenac, N. Y. Ills. 3000 w. Pro Am Inst of Elec Engrs—Oct., 1909. No. 8539 F.

The Short-Period Carrying Capacity of Cables. William A. Del Mar. Develops a corresponding formula and table for cables in such a manner as to determine their over-load time-current curves. Describes investigations. Also editorial. 2000 w. Elec Wld—Dec. 12, 1908. No. 926.

The Distribution of Dielectric Stress in Three-Phase Cables. W. M. Thornton and O. J. Williams. Read before the Engng. Sec. of the British Assn., at Winnipeg. Gives a solution of the problem of finding the voltage gradient at any point in the cross-section of a three-core cable for three-phase currents, at any time during the cycle of electrification. 3500 w. Engng—Aug. 27, 1909. No. 7657 A.

The Calculation of Charging Currents in Three-Phase Cables. Prof. E. W. Marchant. Read before the British Assn., at Winnipeg. Considers the determination of the capacity current flowing into a three-phase line. 1000 w. Elect'n, Lond—Sept. 3, 1909. No. 7731 A.

Cost of High-Tension Underground Cables. Henry Floy. Discusses methods of estimating cost. 1500 w. Elec Wld—Dec. 12, 1908. No. 929.

Underground Cable System in a Village of Two Thousand Inhabitants. J. Franz. Brief illustrated description of a plant at Stockbridge, Mass. 800 w. Elec Wld—July 22, 1909. No. 6613.

Modern Cable Systems. E. M. Hollingsworth. Abstract of paper before the Incor. Munic. Elec. Assn. Discusses aluminum cables and considers the properties of various insulating materials for

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underground cables. Also methods of laying cables. 2500 w. *Elect'n, Lond*—June 25, 1909. No. 6275 A.

Self-Induction of Three-Phase Cables. F. J. O. Howe. Gives tabulated tests and method of calculation. 1000 w. *Elect'n, Lond*—Feb. 12, 1909. No. 2584 A.

Heating of Underground Cables. J. R. Dick. Considers the factors causing a rise of temperature, and the consequences. Ills. 1500 w. *Elect'n, Lond*—June 25, 1909. No. 6276 A.

The Composition and Durability of Cable Papers. C. Beaver. A statement of facts from the cable manufacturer's standpoint. Supplemental to articles by Clayton Beadle and Henry P. Stevens, from the chemist's point of view. Also editorial. 4500 w. *Elect'n, Lond*—July 9, 1909. No. 6420 A.

Electric Cables (Cables électriques). Victor Lebeau. Graphical charts for determining the size of cables for d. c. and a. c. transmission, the heating under certain conditions, etc. Ills. 2500 w. *All Indus*—Aug., 1909. No. 7931 D.

See also Dielectric Strength, and Quotation Testing, under MEASUREMENT; and Induction, under TRANSMISSION.

Circuit Breaking.

Voltage Strains Due to Circuit-Breaking in Direct-Current Systems. L. Silberberg. A mathematical examination of the behavior of voltage and current to ascertain what strains a circuit may undergo during the opening period. 1500 w. *Elec Wld*—Jan. 7, 1909. No. 1668.

Condensers.

Protection Against High-Pressure Discharges. Illustrated description of the Morseicki condenser and its use, combined with the Giles electric valve, for the protection of cables. 1800 w. *Elec Rev, Lond*—Oct. 1, 1909. No. 8481 A.

Conduits.

Underground Construction. H. B. Gear and P. F. Williams. A review of the various systems developed, illustrating and describing present practice. 4500 w. *Elec Age*—Nov., 1908. No. 881.

Underground Lines. H. B. Gear and P. F. Williams. Illustrated description of method of installing underground cables in America. 5000 w. *Elec Age*—Jan., 1909. No. 1863.

Recent Improvements in Underground Conduit Construction. S. B. Way. Illustrated description of the monolithic, all-concrete conduits. 2000 w. *Elec Wld*—June 17, 1909. No. 5573.

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Grounding

The Arrangement of Underground Conduit for Electrical Distribution. Sydney W. Ashe. Describes conduits and distribution system employed in New York City. Ills. Serial. 1st part. 4500 w. *Elec Wld*—June 3, 1909. No. 5274.

Electric Conduit System at Baltimore. Notes from the last report of Charles E. Phelps, Jr., giving the history of this undertaking. 1700 w. *Eng Rec*—Oct. 9, 1909. No. 8446.

See Pipe Lines and Pipe Location, under CIVIL ENGINEERING, WATER SUPPLY.

Direct Current.

Direct-Current Transmission on the Thury System (La Trasmissione dell'Energia elettrica col Sistema Thury a Corrente continua). Salvatore Spera. Discusses the Thury system under the heads, cost, economy and continuity of service. Serial. 1st part. 4000 w. *Industria*—Feb. 21, 1909. No. 3353 D.

Fault Location.

Practical Fault Localizing on Electric Supply Networks. E. P. Austin. A short account of fault localization on a system without a cable-testing outfit. 800 w. *Elec Rev, Lond*—Nov. 13, 1908. No. 434 A.

Four Wire.

Three-Phase Four-Wire Systems. K. Faye-Hansen. Explains the advantages of this system under certain conditions, and matters relating to its installation. Diagrams. 1200 w. *Elect'n, Lond*—Dec. 25, 1908. No. 1523 A.

Frequency.

The Influence of Frequency on the Equipment Circuits of Alternating-Current Transmission Lines. A. E. Kennelly. Presents the computed values of resistances, reactances, inductances and capacities of a particular type of transmission-line for different frequencies. 3000 w. *Elec Wld*—Jan. 21, 1909. No. 1869.

Grounded Neutral.

Earthing the "Neutral" of Three-Wire Systems. Considers the extent to which the main should be earthed, the object, and the calculations regarding neutral earthing conductors. 2500 w. *Elec Rev, Lond*—Sept. 10, 1909. No. 7858 A.

Grounding.

Grounding Secondaries. W. J. Canada. A review of the arguments for grounding and the principal objections raised. 4500 w. *Elec Wld*—April 1, 1909. No. 3751.

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High Tension

Grounding the Secondary. Opinions of central stations on this subject, received by W. J. Canada. Also editorial note. 3000 w. *Elec Wld*—May 27, 1909. No. 5226.

Grounding Electric Light Wires on Water Pipes. F. E. Merrill. A brief review of a study made of grounding electric wires on the water pipes in the city of Somerville, and its results. Discussion. 7500 w. *Jour N Eng W-Wks Assn*—June, 1909. No. 6462 F.

High Tension.

High Tension Transmission. Percy H. Thomas. Discusses the feasibility, earning power, and design of an adequate plant. 6000 w. *Pro Am Inst of Elec Engrs*—May, 1909. No. 4992 F.

Problems of High-Tension Power Transmission. J. G. Pertsch. Brief review of the development of high-voltage transmission, and discussion of the factors tending to a limitation. 1500 w. *Sibley Jour of Engng*—Oct., 1909. No. 8758 C.

Some Features of European High-Tension Practice. Frank Koester. Illustrates and describes especially the features uncommon in American practice. 3300 w. *Elec Age*—Dec., 1908. No. 1227.

Notes on Transmission Practice in the Northwest. Magnus T. Crawford. Read at meeting of the Seattle Sec. of the Am. Inst. of Elec. Engrs. Describes the systems of high-tension transmission in the Pacific Northwest, discussing their merits and defects. 4500 w. *Pro Am Inst of Elec Engrs*—March, 1909. No. 3475 F.

Insulation.

The Composition and Durability of Cable Papers. Clayton Beadle and Henry P. Stevens. Discusses the composition and durability of papers from the chemical point of view, in the present article. Serial review of types, applications, improvement. 4000 w. *Elect'n, Lond*—April 16, 1909. Serial. 1st part. No. 4193 A.

Insulators.

Condenser Type of Insulation for High-Tension Terminals. A. B. Reynders. Explains the difficulties of this problem, and describes the mechanical design of this type of insulated terminal, explaining the principles. Ills. 2000 w. *Pro Am Inst of Elec Engrs*—March, 1909. No. 3478 F.

Discussion on "Condenser Type of Insulation for High-Tension Terminals," and "High Voltage Transformers and Protective and Controlling Apparatus for Outdoor Installation," New York. April 9, 1909. The papers by A. B. Reynders

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and by K. C. Randall are discussed. Ills 13500 w. *Pro Am Inst of Elec Engrs*—Aug. 1, 1909. No. 7059 F.

An Investigation as to the Cause of Breakage in Service of Certain High Tension Glass Insulators. Albert S. Richey and Frederick Bonnet, Jr. Shows the value of polarized light in examining glass insulators. 2500 w. *Jour Worcester Poly Inst*—March, 1909. No. 3448 C.

Flash-Over Voltages. J. Lustgarten. The effects of high voltages on the air, the nature and properties of the gaseous ion, explaining the mechanism of the brush spark and arc discharges, etc. 5000 w. *Elect'n, Lond*—Dec. 18, 1908. No. 1393 A.

Insulation of High-Tension Transmission Lines. F. S. Denneen. Discusses line insulators and their design. 2500 w. *Elect'n, Lond*—Jan. 15, 1909. No. 2070 A.

The Electrical Qualities of Porcelain, with Special Reference to Dielectric Losses. H. F. Haworth. Abstract of a paper read before the Royal Soc. Gives particulars of experiments made to determine the capacity, conductivity and dielectric loss of porcelain and their variations in respect to potential, temperature and time. 2500 w. *Elect'n, Lond*—Jan. 1, 1909. No. 1699 A.

Insulating Materials. Thomas Germann and Stanley M. Hills. From a paper read before the Jun. Inst. of Engrs. Considers the properties and requirements of a good insulator. 3000 w. *Elec Engr, Lond*—July 30, 1909. No. 6974 A.

Researches on the Distribution of Potential at the Surface of Line Insulators (Quelques Recherches sur la Distribution du Potentiel à la Surface des Isolateurs en Ligne). G. Anfossi. Brief description, with results. Ills. 1500 w. *L'Elecn*—June 12, 1909. No. 6535 D.

High-Tension Insulators with Metal Mantles (Hochspannungsisolatoren mit Metaldach). W. Weicker. Describes types and their efficiency. Ills. 2000 w. *Elek Kraft u Bahnen*—June 4, 1909. No. 6710 D.

Insulators for Transmission Lines (Freileitungsisolatoren). M. Gerstmeier. Discusses the requirements of a satisfactory high-tension insulator, methods of testing, etc. Ills. Serial, 1st part. 3500 w. *Elek Kraft u Bahnen*—July 3, 1909. No. 7460 D.

Lightning.

The Theory of Lightning. Daniel S. Carpenter. A study of the accumulation of electricity on the clouds and its close association with the formation of rain-

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Lightning Arresters

drops is given in the present number. 2500 w. Elec Wld—Jan. 7, 1909. Serial.

New Discoveries About Lightning. James Cooke Mills. A report of the experiments made by Alex. Larsen, with comments. 2000 w. Sci Am—Dec. 12, 1908. No. 930.

Divisch, a Lightning-Rod Pioneer, 1754. Brother Potamian. An account of early experimental work. 4000 w. Elec Wld—Jan. 2, 1909. No. 1473.

Attempts to Explain Globular Lightning (Les Tentatives d'Explication de la Foudre globulaire). C. de Jans. An exhaustive discussion of the phenomenon and the various theories suggested. 18800 w. Soc Belge d'Elecn—March, 1909. No. 4207 E.

See also Atmospheric Electricity, under MISCELLANY.

Lightning Arresters.

Methods of Guarding Against Lightning. W. T. Ryan. Illustrates and describes different types of lightning arresters discussing the essential features. 1500 w. Power—Nov. 10 1908. No. 163.

Methods of Guarding Against Lightning. W. T. Ryan. Describes four types of arrester. 1200 w. Power—Nov. 17, 1908. No. 293.

Recent Progress in the Study of Atmospheric Discharges and of Lightning Arresters (Progrès Récents réalisés dans l'Etude des Décharges atmosphériques et des Parafoudres). A. R. Garnier. Ills. 2000 w. L'Elecn—Nov. 21, 1908. No. 1115 D.

The Testing of Lightning Arresters (Sulla Prove dei Parafulmini). Illustra- 3200 w. Elettricità—Nov. 19, 1908. No. 1130 D.

An Aluminum Lightning Arrester Installation. Illustrated description of the installation to protect the transmission system of the Schenectady Power Co.'s 40-cycle, three-phase generating station. 1800 w. Eng News—June 10, 1909. No. 5462.

See also Signalling, under RAILWAY ENGINEERING, CONDUCTING TRANSPORTATION.

Lightning Protection.

Lightning Arresters. David B. Rushmore. Read at meeting of Cent. Elec. Ry. Assn. Describes some recent developments. 3500 w. Sci Am Sup—May 22, 1909. No. 4904.

Lightning Protection. J. V. E. Titus. Abstract of paper before the Am. St. & Int. Ry. Engng Assn. Considers the in-

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stallation of arresters, their design, and the service results. 2500 w. Elec Ry Jour—Oct. 8, 1909. No. 8511.

Guard Wires on Transmission Lines. Max H. Collbohm. Discusses their value as a protection from lightning. 800 w. Elec Wld—May 20, 1909. No. 5044.

Damage by Lightning. Discusses conductor systems and the ignorance of some who are permitted to install them. 3000 w. Elec Rev, Lond—Oct. 1, 1909. No. 8482 A.

Line Construction.

Overhead Construction. H. B. Gear and P. F. Williams. Discusses distributing line work and accessories. Ills. 5800 w. Elec Age—Oct., 1908. No. 47.

Heavy Wire Terminations. Anthony Gorham. Illustrated discussion of methods of construction, especially the use of a cable clamp and strain insulator. 2000 w. Elec Wld—May 27, 1909. No. 5227.

Conditions Encountered by Towers in High-Tension Transmission Lines. N. J. Neall. Considers the limitations of various forms of support, giving an analysis of the service requirements, explaining by a typical case. 6000 w. Elec Wld—July 1, 1909. No. 6106.

Overhead Wires. William Copeland. Suggestions for their erection. 1200 w. Elec Rev, Lond—July 23, 1909. No. 6833 A.

River Crossing by Electrical Transmission Lines (Transports d'Energie électrique: Traversée des Fleuves). M. Déthiollaz. Describes the design of crossings for the Southern Electric Company of France. Mathematical. Ills. Serial, 1st part. 3000 w. Tech Mod—June, 1909. No. 6539 D.

High-Tension Aerial Transmission Lines (Ueber Hochspannungsfreileitung-en). Ludwig Kallir. A comparative study of the Austrian, German, French and Swiss regulations for their safe construction. Ills. Serial, 1st part. 6000 w. Zeit d Oest Ing u Arch Ver—Aug. 27, 1909. No. 7986 D.

The Construction of High-Tension Transmission Lines (Der mechanische Bau von Hochspannungs-Fernleitungen). Herbert Kyser. Discusses the mechanical details of construction, properties of materials, etc. Ills. 3200 w. Elek Kraft u Bahnen—Sept. 14, 1909. No. 8907 D.

See also Telegraph Lines, under COMMUNICATION.

Line Design.

Calculation of the High-Tension Line. Percy H. Thomas. Discusses the calcu-

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lation as relating to regulation and energy line loss, and with especial reference to the unusually long and high power lines, deriving formulae. 6500 w. *Pro Am Inst of Elec Engrs*—June, 1909. No. 5829 F.

An Exact Method for the Determination of the Efficiency, Regulation or Size of Transmission Conductors. Harold Pender. Gives exact formulae for the calculation of the various quantities. 3000 w. *Elec Wld*—June 10, 1909. No. 5401.

Complete Solution of Transmission Line with Distributed Capacity and Leakage. Harold Pender. Gives formulae for practical use, showing how they are derived. 2000 w. *Elec Wld*—July 8, 1909. No. 6221.

Graphical Calculation of Direct-Current Distribution Systems (*Calcul graphique des Distributions électriques à Courant continu*). H. Michel. Illustrates the graphical solution of a number of transmission problems. 5000 w. *Soc Belge d'Elecs*—June, 1909. No. 6500 E.

Errors in Some Methods of Calculating Alternating-Current Transmission Lines. L. W. Rosenthal. Points out the practical conditions under which these solutions may lead to undesirable errors. 700 w. *Elec Wld*—Dec. 19, 1908. No. 1270.

Chart for the Consultation of the Size Lines. L. A. Herdt. Chart with explanation of its construction and use. 2000 w. *Elec Wld*—Jan. 2, 1909. No. 1474.

Extending the Limits of Power Transmission—As Applied Both to Long Distance Transmission of Power and to Power Companies' areas. A. M. Taylor. Read before the Birmingham Sec. of the Inst. of Elec. Engrs. Suggests possibilities in the way of commercial developments, considering overhead and underground lines. 3000 w. *Elec Engr, Lond*—March 12, 1909. No. 3402 A.

The Design of Aerial Transmission Lines (*Zur Berechnung offener elektrischer Leitungen*). J. Sumec. A mathematical discussion of various methods. Ills. 4000 w. *Elektrotech u Maschinenbau*—Dec. 27, 1908. No. 1995 D.

A Quick Method for Determining Sags and Tensions in Transmission Lines. H. J. Glaubitz. Describes an analytical method which is quicker than the graphical method usually employed. 1000 w. *Elec Wld*—March 25, 1909. No. 3511.

The Tension in Transmission-Line Wires (*Sul Calcolo delle grandi Tesate delle Linee di Trasmissione di Energia elettrica*). Diofebo Negrotti. Mathemat-

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Lines

ical discussion of long-span lines. Ills. 3000 w. *Monit Tech*—Jan. 10, 1909. No. 2650 D.

The Crossing of Railways by Transmission Lines (*Considerazioni sul Sistema a tre Tesate di doppi Conduttori cordati adottato per gli Attraversamenti superiori delle Ferrovie*). Manfredo Fasella. A discussion of the new standards of the Italian government. Ills. 2500 w. *Ing Ferro*—April 16, 1909. No. 4851 D.

Line Failures.

The Failure of a Portion of a Steel Tower Electric Transmission Line in California. Edwin Duryea, Jr. An illustrated description of the line and its partial failure during a severe storm. 1700 w. *Eng News*—May 13, 1909. No. 4646.

Line Repairs.

Repairing High-Voltage Lines While in Service. J. S. Jenks and W. H. Acker. Describes methods of working on ungrounded lines in service. 3000 w. *Elec Wld*—Aug. 5, 1909. No. 6904.

Lines.

Notes on Long Distance Transmissions. E. Kilburn Scott. Notes on the development in power transmission work, construction, etc. 2000 w. *Elec Engr, Lond*—Sept. 24, 1909. No. 8340 A.

Some Notes on California High-Tension Transmission Lines. S. L. Foster. Abstract of paper before Am. St. & Int. Ry. Engng. Assn. Describes briefly the conditions and the construction of high-tension lines in California, the insulators used, and precautions necessary in repair work. 2500 w. *Elec Ry Jour*—Oct. 8, 1909. No. 8512.

110,000-Volt Transmission Line at Grand Rapids. Illustrated description of this successful high-tension transmission system. 1800 w. *Can Elec News*—June, 1909. No. 5468 C.

The 110,000 Volt Transmission Line of the Grand Rapids Muskegon Power Company. Features of interest are illustrated and described. 500 w. *Cent Sta*—Feb. 1909. No. 2384.

Joint Pole Lines in Los Angeles. J. E. Macdonald. Explains the causes of the pole nuisance in California, and the combinations adopted to improve conditions. Ills. 700 w. *Elec Wld*—April 22, 1909. No. 4436.

Transmission System of Boston & Northern and Old Colony Street Railway Companies. J. W. Palmer, Jr. Paper read before New England Street Railway Club describing a system having 380

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miles of track. Ills. 2000 w. Elec Ry Jour—June 5, 1909. No. 5251.

A Spanish Power Transmission Plant at 6600 Volts. Brief illustrated description of a high pressure, long distance system of interest. 500 w. Elec Rev, Lond—Jan. 15, 1909. No. 2062 A.

The Distribution System of the Southern Electric Company of France (Réseau de Distribution d'Energie électrique de la Société du Sud électrique). J. A. Montpellier. Ills. Serial, 1st part. 1600 w. L'Eclen—June 12, 1909. No. 6536 D.

See also Central Stations, under GENERATING STATIONS; and Rio Janeiro, under STREET AND ELECTRIC RAILWAYS.

Line Troubles.

The Winter Sleet Storm as a Destroyer of Aerial Lines. Clarence Mayer. An illustrated account of troubles caused by a sleet storm, and the cost. 1500 w. Elec Rev, N Y—Jan. 16, 1909. No. 1758.

Losses.

Output and Regulation in Long-Distance Lines. Percy H. Thomas. Discusses more especially the line-output, regulation or voltage-variation, and the line energy-loss. 9800 w. Pro Am Inst of Elec Engrs—June, 1909. No. 5828 F.

Atmospheric Loss Off Wires Under Direct-Current Pressures. E. A. Watson. Read before the British Assn., at Winnipeg. A report of tests made at the electrical engineering laboratories of the Univ. of Liverpool. 4000 w. Elect'n, Lond—Sept. 3, 1909. No. 7732 A.

Motor Converters.

The Theory and Application of Motor Converters. H. S. Hallo. Describes the principle, operation, design, and characteristics of motor converters, referring to arrangements necessary when used on three-wire and traction systems. Ills. 6000 w. Inst of Elec Engrs—April, 1909. No. 4713 N.

The Theory and Application of Motor Converters. H. S. Hallo. Read before the Inst. of Elec. Engrs. An explanation of the principle, operation, design, and characteristics. Ills. 3000 w. Elec Engr, Lond—May 21, 1909. Serial. 1st part. No. 5185 A.

Permutator.

The Permutator. A description of this current-changing device, with editorial comment. 6000 w. Elec Age—Nov., 1908. No. 879.

TRANSMISSION

Protective Devices

The Permutator. F. J. Wellhouse. An explanation of this machine, a form of electric current converter, and its possibilities, illustrating types. 1500 w. Sib Jour of Engng—June, 1909. No. 5807 C.

Poles.

Some Notes on the Erection of Poles for Overhead Lines. Suggestions helpful to those engaged in this work. 1500 w. Elec Rev, Lond—Oct. 1, 1909. No. 8483 A.

Poles for Power Transmission. An illustrated report of tests made in England of wooden poles for transmission lines. 1800 w. Sci Am Sup—Feb. 13, 1909. No. 2404.

The Strength of Wood Poles (Sulla Rottura dei Pali di Legno nelle Linee elettriche). Salvatore Spera. Mathematical discussion of the stresses in transmission line poles. Ills. 2500 w. Industria—Nov. 15, 1908. No. 1132 D.

How Bent Iron Side Poles Were Made Straight Without Removal in San Francisco. S. L. Foster. Brief illustrated description of method used to straighten poles after the fire. 600 w. Elec Ry Jour—Feb. 6, 1909. No. 2287.

Reinforced Concrete in Electrical Transmission Lines. Illustrated description of methods of making reinforced-concrete poles, and explanation of the advantages claimed. 3500 w. Elec Age—April, 1909. No. 4485.

Concrete Poles (Betonmasten). Describes the Locher system and the cost, strength and economy of poles made by it. Ills. 2000 w. Beton u Eisen—March 11, 1909. No. 4284 F.

Protective Devices.

Storm and Lightning Protection to Live Wires. T. W. Poppe. Suggests the installation of a strong galvanized steel cable to protect the lines from falling branches. Ills. 1000 w. Elec Wld—April 1, 1909. No. 3755.

Protection of Electrical Equipment. P. M. Lincoln. Read at Seattle convention of N.-W. Elec. Lgt. & Power Assn. Discusses the protection of electrical apparatus and transmission lines from the danger of breakdown to which such apparatus is subjected by electrical "surges." 3500 w. Elec Engr, Lond—Oct. 15, 1909. No. 8861 A.

The Protection of Lines Against Surge Tensions and Atmospheric Discharges. Discusses means of effecting a complete protection of the distribution system. 2500 w. Elect'n, Lond—Feb. 26, 1909. No. 3055 A.

ELECTRICAL ENGINEERING

Protective Devices

Free Oscillations in Long Lines (Freie Schwingungen in langen Leitungen). Iwan Dörg. Discusses the use of condensers to protect the line against sudden dangerous rises of voltage. Ills. Serial. 1st part. 4500 w. *Elektrotech u Maschinenbau*—Jan. 31, 1909. No. 2831 D.

The Protection of Low-Pressure Circuits. Gisbert Kapp. Abstract trans. from *Elektrotechnische Zeit.* Describes a safety device which can be adjusted to switch out automatically. 1200 w. *Elect'n*, London—March 19, 1909. No. 3603 A.

The Protection of Electrical Plants against Excess Voltages (Contributo allo Studio sulla Protezione degli Impianti elettrici contro le Sovratensioni). Gino Campos. Reviews the requirements of protective devices and the principles on which they are designed. Ills. 3500 w. *Industria*—April 11, 1909. No. 4848 D.

See also Transformers, under TRANSMISSION.

Protective Relays.

A New System of Sub-Station Relays for Incoming Transmission Lines. Paul MacGahan. Brief description of devices previously used, with reasons for their failure to give complete protection, with description of the latest device for this purpose. 2500 w. *Elec Jour*—Nov., 1908. No. 209.

Reactive Coils.

Air-Blast Reactances. R. E. Scott. Points out a consideration that should be taken into account in judging the size from the rating, or the rating from the size. Ills. 1000 w. *Harvard Engng Jour*—Jan., 1909. No. 3195 D.

Regulations.

Transmission Line Railway Crossings (Le Norme per gli Attraversamenti delle Ferrovie con Conduiture elettriche). Gives the regulations of the Italian Railway Department. Ills. 3000 w. *Ing Ferro*—Feb. 1, 1909. No. 3354 D.

Legislation on the Transmission of Electrical Energy (Législation sur les Distributions d'Énergie électrique). Armand Halleux. Considers the relation of the regulations existing in other countries to conditions in Belgium. 3500 w. *Soc Belge d'Élecns*—Sept., 1909. No. 8601 E.

Resonance.

The Phenomena of Resonance in Electrical Lines. J. Dalemont. Discusses the cause, and accidents due to resonance, and how to avoid them. 1500 w. *Can Engr*—Oct. 1, 1909. No. 8306.

TRANSMISSION

Rotary Converters.

Discussion on "Voltage Ratio in Synchronous Converters, with Special Reference to the Split Pole Converter," and on "Applications of Storage Batteries to Regulation of Alternating-Current Systems." Atlantic City, N. J., July 1, 1908. Papers by Comfort A. Adams, and by J. L. Woodbridge are discussed. 10800 w. *Pro Am Inst of Elec Engrs*—Jan., 1909. No. 1364 F.

Representation of Synchronous Converter Phenomena. Olin J. Ferguson. Gives a graphical method of representing the converter's behavior. 1200 w. *Elec Wld*—Jan. 21, 1909. No. 1870.

The Practical Operation of Rotary Converters (Instructions pratiques sur la Conduite des Commutatrices). J. A. Montpelier. The first part of the serial discusses starting. Ills. Serial. 1st part. 1800 w. *L'Élec'n*—Jan. 16, 1909. No. 2630 D.

The Kolben-Seidener Converter (Periodenumformer System Kolben-Seidener). August Bloch. A description and discussion of this machine. Ills. 4000 w. *Elektrotech u Maschinenbau*—April 18, 1909. No. 5068 D.

Substations.

Sub-Stations. H. B. Gear and P. F. Williams. The design, equipment and management of sub-stations to secure economy of operation. Ills. 6500 w. *Elec Age*—Feb., 1909. No. 2509.

Apparatus for Direct-Current Substation. E. W. Allen. Abstract of paper read before the Assn. of Edison Ill. Co. Concerning the advantages and disadvantages of the different machines used. 2200 w. *Elec Wld*—Nov. 14, 1908. No. 229.

Large New Substations of the Chicago Railways Company. Drawings and description of construction details. 1000 w. *Elec Ry Jour*—Jan. 2, 1909. No. 1433.

Transformer Substation for Niagara Energy at Rochester, N. Y. Brief illustrated description. 1500 w. *Elec Wld*—Feb. 18, 1909. No. 2516.

Three-Wire.

The Three-Wire System with One Dynamo. Cecil P. Poole. Explains why the neutral wire is needed; methods used for compensating unbalanced load, etc. Ills. 1500 w. *Power*—Jan. 5, 1909. (Special No.) No. 1485 D.

See also Insulation, under MEASUREMENT; Balancing, under TRANSMISSION; and Conductors, under STREET AND ELECTRIC RAILWAYS.

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TRANSMISSION

Transformers

Transformers.

Characteristics and uses of Transformers. R. H. Fenkhausen. Considers their selection and care, how to connect them up, etc. Ills. 1500 w. Power—Nov. 3, 1908, No. 41.

Transformers. W. B. Kouwenhoven. Explains the principle upon which a transformer operates. 2500 w. Ry & Loc Engng—Jan., 1909. No. 1448 C.

The Electrical Transformer. Norman G. Meade. An illustrated practical explanation of the essential features and different types, what they are used for, how cooled, etc. 1500 w. Power—Oct. 5, 1909. No. 8319.

High Voltage Transformers and Protective and Controlling Apparatus for Outdoor Installation. K. C. Randall. Discusses the design and construction of outdoor apparatus, considering the application. Ills. 3000 w. Pro Am Inst of Elec Engrs—March, 1909. No. 3479 F.

Transformers: Some Theoretical and Practical Considerations. A. P. M. Fleming and K. M. Faye Hansen. Abstract of a paper read before the Manchester Local Sec. of the Inst. of Elec. Engrs. Gives in full the remarks on the practical side. Ills. 4000 w. Elec Engr, Lond—Dec. 4, 1908. No. 1006 A.

The Design of Transformers With Minimum Cost for Materials (Berechnung von Transformatoren auf den Mindestbetrag an Kosten des wirksamen Materials). J. T. Duyvis. Mathematical discussion of the Pohl and Bohle method. Ills. 3200 w. Elektrotech u Maschinenbau—Feb. 14, 1909. No. 3556 D.

Recent Developments in Transforming Apparatus. H. W. Tobey. Read before the Schenectady Sec. of the Am. Inst. of Elec. Engrs. Describes and discusses recent devices. 6500 w. Pro Am Inst of Elec Engrs—April, 1909. No. 3958 F.

Transformers. H. B. Gear and P. F. Williams. Explains the laws governing the design of the transformer, the types of windings and core used, discussing matters relating to efficiency, etc. Ills. 5000 w. Elec Age—April, 1909. No. 4484.

Dimensions of Single-Phase Core and Shell Transformers, with Copper and Iron Circuits of Uniform Rectangular Cross-Section. A. R. Low. Read before the Inst. of Elec. Engrs. Mathematical. 2000 w. Elec Engr, Lond—Aug. 13, 1909. No. 7198 A.

The Limitations of Party Transformer Distribution. J. Frank Martin. Considers the minor engineering principles and details essential to the highest efficiency

of apparatus. Ills. 1700 w. Elec Age—May, 1909. No. 5429.

The Practical Aspects of Recent Improvements in Transformers. W. A. Layman. Read before the N. E. L. A. Points out the way in which some of the improvements have been made possible. 2500 w. Elec Age—June, 1909. No. 6134.

Distributing Transformers. E. G. Reed. Traces the development, showing the requirements, and discussing the electrical and mechanical characteristics. Ills. 4500 w. Elec Jour—July, 1909. No. 6437.

Large Transformers for Electrochemical Applications (Transformateurs de grande Puissance pour Applications électrochimiques). Gives data of performance of apparatus built by the Oerlikon Company. Ills. 4500 w. L'Ecléc—May 29, 1909. No. 5730 D.

The Theory of Current Transformers (Zur Theorie des Stromtransformatoren). M. Seidner. Mathematical. Ills. 4000 w. Elektrotech u Maschinenbau—June 6, 1909. No. 6714 D.

The Design of Shell-Type Transformers. Roger P. Heller. Suggestions concerning methods that may be employed in selecting the final dimensions. 1200 w. Elec Wld—Sept. 9, 1909. No. 7621.

Transformation Wrinkles. H. B. Gear and P. F. Williams. Explains various applications of the booster, and devices useful under certain conditions. Diagrams. 3500 w. Elec Age—March, 1909. No. 3216.

Three-Phase—Two-Phase Transmission by Standard Transformers. L. A. Starrett. Presents methods of transforming which have proved satisfactory. 1000 w. Elec Jour—Dec., 1908. No. 978.

Transformer Sets for Variable Voltage Electric Furnace Requirements. C. I. Zimmerman. Describes two methods of obtaining variable voltages when currents as high as 40,000 or more amperes are needed. 3000 w. Wis Engr—Dec., 1908. No. 2734 D.

4450 Kilovolt-Ampere Transformers for Electrochemical Work (Transformatoren von 4450 KVA für elektrochemische Zwecke). M. H. Yazidjian. Illustrated detailed description. 3500 w. Elektrotech u Maschinenbau—Jan. 17, 1909. No. 2829 D.

"C. M. B." Patent Direct-Current Rotary Transformer. J. C. Macfarlane and H. Burge. Describes the construc-

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tion and discusses applications. Ills. 3500 w. Elec Engr, Lond—July 9, 1909. No. 6418 A.

"C. M. B." Patent Direct Current Rotary Transformer. J. C. Macfarlane and H. Burge. Describes construction and discusses applications of a new type of rotary electric transforming machine. 3000 w. Elec Rev, Lond—July 23, 1909. No. 6832 A.

Chart for Determining the Efficiencies of Transformers. Henry C. Stanley. Gives chart for determining efficiencies at $\frac{1}{4}$ load intervals from $\frac{1}{4}$ load to $1\frac{1}{4}$ load. 500 w. Elec Wld—Jan. 2, 1909. No. 1475.

Tests of a 100,000-Volt Transformer (Versuche mit 100,000 Volt-Transformatoren). Gustav Benischke. Describes the tests and discusses the results. Ills. 1800 w. Elek Kraft u Bahnen—Dec. 4, 1908. No. 1989 D.

Comparative Tests of Transformers. A. C. Scott. Gives results of a comparison of the performances of one-kilowatt units of certain commercial lines of transformers. 2000 w. Elec Wld—Feb. 4, 1909. No. 2269.

Transformer Connections. Considers some of the most common problems. 1500 w. Prac Engr—Dec. 11, 1908. Serial. 1st part. No. 1200 A.

The Parallel Operation of Transformers. J. Murray Weed. A study of the distribution of current, losses, and action. 3500 w. Elec Wld—Nov. 21, 1908. No. 337.

Parallel Operation of Stationary Transformers. H. Bewlay. Gives a method of calculating the loading of each transformer and an investigation of the probable errors. 800 w. Elec Wld—Nov. 21, 1908. No. 338.

Interconnections of Transformers in Four-Wire Three-Phase Systems. K. Faye-Hansen. Diagrams of connections, with explanatory notes. 1000 w. Elec Wld—Nov. 28, 1908. No. 636.

The Parallel Connection of Three-Phase Transformers. A method to aid in correct inter-connection, given by K. Faye-Hansen, in the E. T. Z. 800 w. Elec Rev, Lond—Dec. 11, 1908. No. 1208 A.

Parallel Operation of Transformers. J. B. Gibbs. Shows the method of determining the division of the load between the transformers and the importance of attending to characteristics of transformers to be connected. 2000 w. Elec Jour—May, 1909. No. 4545.

Three-Phase Transformer Connections and Resulting Voltages. A. D. Williams

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Jr. Diagrams and explanatory notes. 1000 w. Power—April 20, 1909. No. 4049.

Star and Delta Transformer Interconnections. W. T. Ryan. Discusses the various types of interconnection, considering disturbances that may arise in a three-phase system. 600 w. Elec Wld—Dec. 5, 1908. No. 809.

The Regulation of Potential Transformers and the Magnetizing Current. M. G. Lloyd and P. G. Agnew. Shows that the current has an inappreciable effect upon the regulation. 2000 w. Elec Rev, N Y—Aug. 7, 1909. No. 6939.

Switch Gear for Transformer Installations (Schaltanlagen für Umformerwerke). H. Probst. Illustrates and describes several recent typical installations. Serial. 1st part. 1500 w. Elek Kraft u Bahnen—Jan. 4, 1909. No. 2823 D.

The Distribution and Conduction of Heat in an Annular Plate (Ueber die Verteilung und Leitung der Wärme in einer kreisringförmigen Platte). Karl Kohler. Refers principally to methods of improving the temperature conditions of transformers. Ills. 3200 w. Elektrotech u Maschinenbau—Oct. 18, 1908. No. 594 D.

The Distribution of Heat in an Annular Plate (Die Verteilung der Beharrungstemperatur in einer kreisringförmigen Platte). Fritz Emde. A mathematical paper in amplification of the article by Karl Kohler. Ills. 3200 w. Elektrotech u Maschinenbau—Feb. 21, 1909. No. 3557 D.

The Leakage Field and Leakage Coefficients of a Transformer with Disc Winding and Divided End Coils (Ueber das Streufeld und den Streukoeffizienten eines Transformators mit Scheibenwicklung und geteilten Endspulen). W. Rogowski. Mathematical. Ills. 2200 w. Zeitschr d Ver Deutscher Ing—June 12, 1909. No. 6726 D.

Electrical Measurements on Circuits Requiring Current and Potential Transformers. L. T. Robinson. Discusses the causes which make certain corrections necessary either in the manufacture of the transformer or in their use; methods for determining the variations; and the corrections. Ills. 7000 w. Pro Am Inst of Elec Engrs—July, 1909. No. 6498 F.

Relations Between Output, Losses, Dimensions, Weight and Cost of Transformers. E. G. Reed. Deals with the effect of changing the design proportions. 2500 w. Elec Wld—Sept. 9, 1909. No. 7622.

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Discussion on "Electrical Measurements on Circuits Requiring Current and Potential Transformers" Discussion at Frontenac, N. Y., of L. T. Robinson's paper. 3500 w. Pro Am Inst of Elec Engrs—Oct., 1909. No. 8541 F.

The Testing of Transformer Steel. M. G. Lloyd and J. V. S. Fisher. Discusses the conditions that should be realized, describing a modification of the Epstein method and apparatus, giving results obtained. 6500 w. Bul Bureau of Stand—May, 1909. No. 6368 N.

The Testing of Transformer Steel. M. G. Lloyd and J. V. S. Fisher. Discusses the conditions which should be realized in the measurement of energy losses in sheet-iron and steel subject to alternating magnetization, describing a modification of the Epstein method and apparatus. 6000 w. Pro Am Inst of Elec Engrs—July, 1909. No. 6600 F.

Discussion on "Testing of Transformer Steel." The paper by M. G. Lloyd and J. V. S. Fisher is discussed at Frontenac, N. Y. 2500 w. Pro Am Inst of Elec Engrs—Oct., 1909. No. 8535 F.

Corona Phenomena in Air and Oil and Their Relation to Transformer Design. W. S. Moody and G. Faccioli. Describes experiments made, showing the complex nature of the study. Ills. 5800 w. Pro Am Inst of Elec Engrs—July, 1909. No. 6485 F.

Discussion on "Corona Phenomena in Air and Oil and Their Relation to Transformer Design." The paper of W. S. Moody and G. Faccioli, as discussed at Frontenac, N. Y. 2500 w. Pro Am Inst of Elec Engrs—Oct., 1909. No. 8538 F.

Oil Used in Electric Transformers. W. B. Kouwenhoven. Explains the purpose for which the oil is used, the care needed, and the qualities required. 2000 w. Ry & Loc Engng—April, 1909. No. 3657 C.

See also Transformer Testing, and Dynamo Testing, under MEASUREMENT; and Insulators, and Substations, under TRANSMISSION.

Troubles.

Lessons from Some Recent Electrical Troubles. Cites a number of accidents due to improper operation. 1700 w. Elec Wld—Dec. 5, 1908. No. 810.

Principles of Fault-Location. Julius Bernstein. Condensed paper read before the Int. Assn. of Munic. Engrs. at Detroit. Describes the use of Wheatstone testing instruments. Diagrams. 4500 w. Sci Am Sup—May 1, 1909. No. 4332.

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Method of Testing for Grounds or Short Circuits by Induction. W. H. Geiger. Describes methods. Diagrams. 2500 w. Sig Engr—April, 1909. No. 4001.

Underground.

Discussion on "High-Potential Underground Transmission." New York, Oct. 9, 1908. Discussion of paper by P. Junkersfeld and E. O. Schweitzer. 10500 w. Pro Am Inst of Elec Engrs—Jan., 1909. No. 1366 F.

Underground Cable and Service Distribution, Edison System. Ralph W. Krass. Deals with the underground installations of the various systems, and describes the method of connection with overhead feeders for outlying districts. 2500 w. Sib Jour of Engng—Dec., 1908. No. 1352 C.

See also Conduits, under TRANSMISSION.

Voltage.

Length and Voltage of Transmission Lines. Alton D. Adams. Discusses the influence of pressure upon electrical transmission. 2500 w. Cassier's Mag—Feb., 1909. No. 2331 B.

Voltage Losses.

Voltage Loss in Alternating-Current Overhead Lines. J. A. Morton. Describes, in terms of British conditions and practice, the method for finding voltage losses as given by C. F. Scott and C. P. Fowler, in the *Elec. Jour.* 1800 w. Elec Rev, Lond—Jan. 8, 1909. No. 1805 A.

Chart for Calculation of Voltage Losses. H. P. Liversidge. Gives chart, describing its construction and use. 1200 w. Elec Rev, N Y—July 31, 1909. No. 6787.

Voltage Regulation.

Conditions Affecting Stability in Electric Lighting Circuits. Elihu Thomson. Discusses mainly the constant-current series circuits containing arc lamps, reviewing the methods tried during the last 30 years to obtain stability. 7500 w. Pro Am Inst of Elec Engrs—Jan., 1909. No. 1362 F.

Discussion on "Conditions Affecting Stability in Electric Lighting Circuits." New York, Jan. 8, 1909. Gives the discussion on Elihu Thomson's paper. 8000 w. Pro Am Inst of Elec Engrs—March, 1909. No. 3480 F.

Discussion on "Conditions Affecting Stability in Electric Lighting Circuits," New York, Jan. 8, 1909. The paper by Elihu Thomson is discussed. 2500 w. Pro Am Inst of Elec Engrs—May, 1909. No. 4997 F.

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Voltage Regulation

Alternating-Current Feeder Regulators. W. S. Moody. Considers types of regulators and their control. Ills. Discussion. 5500 w. *Pro Am Inst of Elec Engrs*—Nov., 1908. No. 667 D.

The Determination of the Current and Voltage Relations in Unsymmetrical Polyphase Systems. Charles H. Porter. Deals with a method which solves the problems as easily as corresponding problems in direct-current work, using simultaneous vector equations. 1200 w. *Elec Wld*—July 29, 1909. No. 6763.

Protection and Safety from Excess Voltages (Gesichtspunkte hinsichtlich Schutz und Sicherheit gegen Ueberspannungen). Karl Kuhlmann. Mathematical discussion of the possible causes of excess voltages. Ills. Serial. 1st part. 2800 w. *Elektrotech Zeitschr*—Nov. 12, 1908. No. 1300 B.

Excess-Voltage Protective Devices of the Société Générale des Condensateurs Electriques, Freiburg (Ueberspannungssicherungen nach dem System der Société Générale des Condensateurs Electriques, Freiburg). Illustrated description and report of tests. Serial. 1st part. 2400 w. *Elektrotech u Maschinenbau*—Nov. 22, 1908. No. 1187 D.

Voltage Regulation on a Three-Wire Network (Ueber eine Spannungsregulierung in Dreileiternetzen). F. Niethammer and R. Czepet. Describes a system. Ills. 1700 w. *Elektrotech u Maschinenbau*—June 27, 1909. No. 6718 D.

Application of the Thury Automatic Regulator in Electrical Plants (Application du Régulateur automatique, Système Thury, dans les Installations élec-

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triques). Illustrated detailed description of the apparatus and some of its applications. 2600 w. *Génie Civil*—Dec. 12, 1908. No. 1929 D.

The Thury Automatic Regulator (Régulateurs automatiques Système R. Thury). Describes its construction, operation, regulation, and applications. Ills. 3000 w. *Bul Tech d l Suisse Rom*—Feb. 25, 1909. No. 3336 D.

The Tirrill System of Voltage Regulation for Single- and Three-Phase Generators (Régulateur automatique de Tension pour Génératrices monophasées et triphasées Système Tirrill). C. Waldschmidt. Describes and discusses the principle of the Tirrill regulator and its working. Ills. 5000 w. *Soc Belge d'Elecns*—April, 1909. No. 4814 E.

See also Losses, under TRANSMISSION.

Wire Joints.

Wire Joints for Transmission Lines (Ueber Drahtbündungsverfahren für Freileitungen). Robert Nowotny. A review of developments since the invention of the Arld joint. Ills. Serial. 1st part. 1200 w. *Elektrochem Zeitschr*—April, 1909. No. 4854 D.

Wire Specifications.

The New Specification for Hard Drawn Copper Wire. Edward N. Lake. Comments on the proposed standard specifications of the Am. Soc. for Test. Materials, from the standpoint of the purchaser's engineer, with special reference to wire and cable for electric railway use. 1800 w. *Elec Ry Jour*—Sept. 18, 1909. No. 7793.

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Accidents.

Electrical Accidents Around Machinery and Their Prevention. Robert J. Young. Briefly considers dangers from shocks, burns, flashes, and falls, and the precautions found effective. Ills. 1000 w. *Elec Wld*—Aug. 12, 1909. No. 7014.

The Dangers of Electrical Transmission Lines and Apparatus and Necessary Precautions for Safety (Des Dangers des Canalisations et Appareils électriques et des Précautions à Prendre). A. Meynier. A general review of dangers of electric shocks and suggestions for preventing accidents. 4500 w. *L'Elec*n—July 17, 1909. No. 7221 D.

Fires and Accidents in Electrical Installations. H. S. Knowlton. Considers some causes of troubles. 1800 w. *Power*—Sept. 7, 1909. No. 7598.

Agriculture.

The Influence of Electricity on Vegetation (Die Beeinflussung des Pflanzenwachstums durch Elektrizität). Max Breslauer. A review of researches and recent results. Serial. 1st part. 2200 w. *Elektrochem Zeitschr*—April, 1909. No. 4853 D.

Aluminium.

Aluminium in Transmission Lines (Emploi de l'Aluminium pour l'Etablissement des Canalisations électriques). J.

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Atmospheric Electricity

A. Montpellier. Discusses the production of aluminium and its physical properties, and enumerates the important aluminium transmission lines in existence. Ills. 3200 w. *Elec*n—Aug. 14, 1909. No. 7929 D.

See also same title, under MINING AND METALLURGY, MINOR MINERALS.

Atmospheric Electricity.

Recent Observations in Atmospheric Electricity. P. H. Dike. A review of recent investigations by a number of experimenters. 5000 w. *Am Jour of Sci*—March, 1909. No. 2927 D.

Calculating Device.

An Electrical Device for Solving Equations. Describes the device presented by Alexander Russel and Arthur Wright to the Physical Society of London, which can solve equations to the n th degree, besides performing other calculations. 1000 w. *Elec Wld*—July 15, 1909. No. 6337.

The Arthur Wright Electrical Device for Evaluating Formulae and Solving Equations. Alexander Russell and Arthur Wright. Abstract of paper before the Phys. Soc. Describes a device combining the principle of the ordinary logarithmic slide rule with addition and subtraction. 1600 w. *Elect'n*, Lond—Sept. 17, 1909. No. 8114 A.

Conversion Tables.

Horse-Power and Kilowatts. Gives tables for changing horse-power into watts and vice versa, with explanation. 1700 w. *Power*—April 20, 1909. No. 4051.

Electrical Industry.

The National Electrical Code and the Relation of the Contractor to the Central Station. W. H. Blood, Jr. Read before the Nat. Elec. Con. Assn. A brief discussion of the importance of each in the development of the electrical industry. Also editorial. 3500 w. *Cent Sta*—Sept., 1909. No. 7686.

Electric Clocks.

The Present Status of Electric Clocks (Ueber den gegenwärtigen Stand der elektrischen Uhren). W. Krejza. A generalments, etc. 3300 w. *Elektrotech u Maschinenbau*—Feb. 28, 1909. No. 3559 D.

Eiffel Tower Device for Showing Hour. Illustrated description of a novel incandescent lamp device and its system of operation. 1500 w. *Sci Am Sup*—April 24, 1909. No. 4114.

Electric Clocks for Railway Service (Elektrische Uhren mit besonderer Berücksichtigung für die Eisenbahnen). Herr Zacharias. Discusses the require-

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ments of railway time service and the advantage of electric clocks. 2500 w. *Glaser's Ann*—June 15, 1909. No. 6589 D.

Electric Time Service in Eastern Observatories. Illustrated description of the two new master clocks installed at the observatory in Mauritius, and their operation. 1500 w. *Elec Rev*, Lond—Oct. 15, 1909. No. 8865 A.

Electric Hygrometer.

An Electrical Method for the Measurement of the Amount of Moisture in Grain and Other Materials. Anthony Zeleny. Illustrated description of an instrument devised for rapidly and accurately determining the amount of moisture in corn. 1500 w. *Minn Engr*—March, 1909. No. 4064 C.

Electric Piano-Players.

The Development of the Electric Piano Player. John F. Kelly. Reviews work in this field since 1850, especially describing the players now made by the Teleelectric Co. Ills. 3500 w. *Jour Fr Inst*—Jan., 1909. No. 1847 D.

Electric Pianos.

Electric Pianos (Pianos électriques). Georges Dary. Illustrated description of their mechanism and electrical connections. 3000 w. *L'Elec*n—June 5, 1909. No. 6533 D.

Electromagnets.

The Weiss Laboratory Electromagnet and the Cotton Absolute Electromagnetic Balance (Elektromagnete für Laboratoriums zwecke von Prof. Dr. P. Weiss und die absolute elektromagnetische Wage von Cotton). Georges Zindel. Illustrated description of these instruments. 2200 w. *Schweiz Bau*—May 8, 1909. No. 5767 B.

Exhibitions.

Electrical Exhibition at Manchester, England. Sidney Ransom. A general survey, with illustrations. 1200 w. *Elec Wld*—Nov. 14, 1908. No. 226.

Fire Alarms.

Albany Fire Alarm Equipment. Illustrated general description of recently completed central office equipment of the fire department. 2000 w. *Munic Jour & Engr*—Feb. 3, 1909. No. 2235.

Fire Risks.

Electricity and Fire Hazards. Noel Murray. Abridged paper read before the Elec. Assn. of Victoria, Australia. States the principal causes of electrical fires. 3500 w. *Aust Min Stand*—Dec. 9, 1908. No. 1896 B.

ELECTRICAL ENGINEERING

General Electric Co.

General Electric Co.

Pioneer Developments Within the General Electric Company. Dr. E. W. Rice, Jr. Read before the Schenectady Sec. of the Am. Inst. of Elec. Engrs. Historical review from the year 1880, when the American Electric Co. was formed, to 1888. 5000 w. Pro Am Inst of Elec Engrs—March, 1909. No. 3476 F.

Germany.

Electric Industry in Germany. Walde-mar Koch. Reviews important features of its development. 1500 w. Elec Jour—Jan., 1909. No. 2271.

High-Frequency Apparatus.

The Construction of High-Frequency Apparatus. George T. Hanchett. Describes features to be recommended by reason of their convenience and low cost. Ills. 2200 w. Elec Wld—July 1, 1909. No. 6108.

Montreal.

Electric Light and Power at Montreal. William H. Stuart. Describes the electric light and power business as conducted by the Montreal Heat, Light, and Power Co. 2200 w. Elec Wld—July 1, 1909. No. 6105.

Nickel Alloys.

Resistivity and Thermo-Electric Properties of Nickel and Its Common Alloys and Their Industrial Applications (Résistivité et Thermo-Électricité des nickels et de leurs Alliages Usuels, Applications Industrielles). H. Pécheux. A review of their application in the electrical industries. Ills. 5600 w. Rev Gen des Sci—Sept. 30, 1909. No. 8611 D.

Problems.

The Technical and Social Problems of the Distribution of Electrical Enrgy (Il Problema tecnico e sociale della Distribuzione di Energia elettrica). C. Coltri. Refers particularly to conditions in Italy. Serial, 1st part. 3000 w. Industria—Nov. 29, 1908. No. 1135 D.

Resistances.

A New Form of Standard Resistance. Edward B. Rosa. Gives illustrated description of the new sealed standards, the apparatus employed in comparing coils, and the results. 5400 w. Bul Bureau of Stand—Feb., 1909. No. 3287 N.

Self-Regulating Resistances (Neuerungen an selbstregelnden Belastungswiderständen). Martin Kallman. Illustrated description of types and discussion of

MISCELLANY

Time Signals

their principles. 1800 w. Elek Kraft u Bahnen—April 24, 1909. No. 5065 D.
Review of 1908.

A Review of the Year in the Electrical Industry. Brief review of the important divisions of this industry. 6000 w. Elec Rev, N Y—Jan. 2, 1909. No. 1464.

Review of Electrical Progress in Great Britain During 1908. Albert H. Bridge. A résumé of present conditions of electrical manufacturing, lighting and power. Ills. 2200 w. Elec Rev, N Y—Jan. 2, 1909. No. 1465.

Electrical Engineering, 1908. A review of progress, especially in Great Britain, and applications made. 4000 w. Engr, Lond—Jan. 1, 1909. No. 1715 A.

Electrical Developments on the Continent. C. L. Durand. Considers progress made in electric traction, power, electrochemistry, telegraphy and telephony. 2500 w. Elec Rev, N Y—Jan. 2, 1909. No. 1466.

The Progress of Electrical Science During 1908. E. E. Fournier d'Albie. A general review. 2500 w. Elect'n, Lond—Feb. 12, 1909. No. 2583 A.

Spark Coils.

The Design and Operation of Jump-Spark Coils. F. W. Springer. An investigation of the varieties of spark obtainable, as generated by jump-spark coils of the vibrating and non-vibrating types. Also editorial. 4500 w. Elec Wld—June 24, 1909. No. 5892.

Standardization.

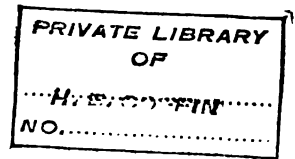
International Electrical Standardization. Ormond Higman. Abstract of paper read before the Engng Soc. of the British Assn. at Winnipeg. Discussing the general organization and the aims and objects of this movement. 4500 w. Engng—Sept. 17, 1909. No. 8128 A.

Symbols.

A Contribution to the Statistics of International Electrical Engineering Symbolology. A. E. Kennelly. Gives tabulated results of an examination into the notation of recent text-books from France, Germany, Great Britain, Italy and the United States. 1800 w. Elec Wld—Aug. 12, 1909. No. 7013.

Time Signals.

Electrical Time Service in Mauritius. E. D. Pearmain. Illustrates and describes the time signal system installed on this island of the Indian Ocean. 2000 w. Elec Rev, Lond—April 9, 1909. No. 3987 A.



INDUSTRIAL ECONOMY

Accidents

Accidents.

A Year's Industrial Accidents in Pittsburgh. Crystal Eastman. Condensed from the Pittsburgh Survey in *Charities and the Commons*. Information concerning causes. 3500 w. Am Mach—Vol. 32. No. 13. No. 3055.

Industrial Accidents and Employer's Liability. Information from a pamphlet giving results of an investigation at Pittsburgh, made by Miss Crystal Eastman. 6000 w. Eng News—June 17, 1909. No. 5575.

Accounting.

Some Recent Changes in Government Accounting. H. Parker Willis. Gives representative examples of each of the important classes of changes introduced during Mr. Roosevelt's term of office, as illustrative of the new point of view adopted. 8000 w. Jour of Acc—April, 1909. No. 4337 C.

The Accounting of Industrial Enterprises. William M. Lybrand. Discusses pools, trusts, holding companies, advantages of combination, evils of monopoly, etc. 3000 w. Jour of Acc—Nov., 1908. Serial, 1st part. No. 478 C.

Establishment Expenses and Their Relation to Cost Accounts. Henry Spencer. An examination and comparison of alternative general practices. 2000 w. Engr, Lond—Nov. 13, 1908. Serial, 1st part. No. 451 A.

Modern Methods and the Business Specialist. Ellsworth M. Taylor. On the new development in business practice, and the need of scientific systematic methods. 3500 w. Ir Age—July 15, 1909. No. 6341.

Electric Manufacturing Companies' Accounts. Discusses matters in connection with the affairs of such companies, outlining a system. 2000 w. Elec Rev, Lond—Dec. 18, 1908. No. 1392 A.

Machine-Shop Cost Accounting by Machinery. Illustrated description of the tabulating-machine system, explaining its advantages. 2500 w. Am Mach—Vol. 32. No. 7. No. 2512.

Accounting

Machine Accounting in Machine-Tool Building. Describes the use of the tabulating machine in the cost accounting department of the Bullard Machine Tool Co. 2800 w. Am Mach—Vol. 32. No. 11. No. 3219.

The Machine Hour. F. E. Webner. The first of a series giving details of accounting plans as applied in the works of the Marion Steam Shovel Co. The present number deals with the antecedents and development of the machine hour idea. 3000 w. Ind Engng—April, 1909. Serial, 1st part. No. 4076 C.

Distribution of Indirect Costs by the Machine Hour Method. Gershom Smith. Outlines the application of the machine hour to the distribution of indirect cost, to determine correct rates. 3500 w. Engineering Magazine—June, 1909. No. 4987 B.

Foundry Accounting Methods. John Doughton. Read before the Phila. Found. Assn. Discusses the proper handling of customers' orders. 3000 w. Ir Age—Nov. 12, 1908. No. 217.

A Model Foundry Accounting System. R. W. McDowell. Explains method of recording orders, billing, and charging. 1800 w. Foundry—Nov., 1908. No. 55.

The Office, Accounting and Cost-Keeping System; Department of Greater Water Supply, Peoples Water Company, Oakland, Cal. Langdon Pearse. Explains the system used and the conditions. 4000 w. Eng Rec—Nov. 14, 1908. No. 253.

Industrial Accounting (Les Techniciens de la Comptabilité). Maurice Bellom. Discusses the training of accountants in various countries. Serial, 1st part. 5000 w. Tech Mod—April, 1909. No. 4832 D.

Inventory Books for Factories (Inventarienbücher für Industriebetriebe). Herr Lewin. Illustrates and describes two forms. 2500 w. Zeitschr für Werkzeug—Jan. 25, 1909. No. 2694 D.

Inventory Books for Real Estate, Buildings, Tools, Patterns and Furniture (Inventarienbücher für Grundstücke, Gebäude, Werkzeuge, Modelle, und Mobilier). C. M. Lewin. Illustrates and describes satisfactory types. Serial, 1st

Accounting

part. 2400 w. *Zeitschr f Werkzeug—*
Feb. 25, 1909. No. 3386 D.

Inventory Books for Industrial and Manufacturing Plants for the Control of Depreciation and Insurance Allowances (*Inventarienbücher für Maschinen und Werkzeuge zur Kontrolle der Abschreibungen und der Feuerversicherungspolizen*). C. M. Lewin. An explanation of the method of keeping a continuous inventory. Ills. 4500 w. *Elektrotech u Maschinenbau—*June 20, 1909. No. 6717 D.

See also same title, under MINING AND METALLURGY, MINING.

Alaska.

Alaska. A. J. Quigley. An illustrated account of the wealth of its natural resources, and its commercial possibilities. 6000 w. *Cassier's Mag—*Oct., 1909. No. 8464 B.

Apprenticeship.

Apprenticeship Training. The report of C. W. Cross to the Master Mechanics' Assn. on the progress made in the apprenticeship systems for railroad shops. 3000 w. *Boiler Maker—*Nov., 1908. No. 13.

Practical Results from a Modern Apprenticeship System. C. W. Cross. Concerning results obtained from the apprenticeship system of the New York Central lines. Also discussion. 6500 w. *Pro Ry Club of Pittsburgh—*Sept. 25, 1908. No. 204 C.

Industrial Training Through Apprenticeship Systems. E. P. Bullard. Read before the Nat. Met Trds. Assn. Discusses the value of apprentice systems in raising the standard of industrial intelligence and related subjects. 2500 w. *Ir Age—*April 22, 1909. No. 4098.

Apprenticeship by the School and by the Shop (*L'Apprentissage par l'Ecole et par l'Atelier*). E. Labbe. A discussion of conditions in France, favoring trade-school instruction. Serial. 1st part. 2500 w. *Tech Mod—*April, 1909. No. 4833 D.

See also same title, under RAILWAY ENGINEERING, MISCELLANY.

Argentina.

Modern Argentina and its Commercial Relations with Belgium (*L'Argentine moderne et ses Relations commerciales avec la Belgique*). C. Lambotte. A review of agriculture, industrial and commercial progress. 4500 w. *Rev de Métal—*March, 1909. No. 4213 E + F.

Cost Systems

Austria.

Cost of Engineering Materials and Labor in Austria. Editorial, giving authentic figures concerning the cost of labor and engineering materials in different districts. 1700 w. *Engng—*Feb. 5, 1909. No. 2489 A.

Conservation.

See Natural Resources, under INDUSTRIAL ECONOMY.

Co-partnership.

Co-partnership and Unemployment. Sir Benjamin C. Browne. Reviews some of the schemes that have been tried. 3000 w. *Engr, Lond—*Dec. 4, 1908. No. 1021 A.

Co-partnership and Unemployment. George N. Barnes. A reply to the article by Sir Benjamin C. Browne, putting forth the labor view of the subject. 3000 w. *Engr, Lond—*Jan. 8, 1909. No. 1822 A.

Cost Systems.

Errors and Difficulties in Fixing Manufacturing Costs. W. M. S. Miller. Gives a practical plan for correct distribution of expenses. 3300 w. *Engineering Magazine—*Feb., 1909. No. 2162 B.

A Simple Cost System for Complex Situations. John Sturgess. Outlines systems that failed and the reasons, and describes a system enabling accurate costs to be obtained at moderate expense. 3000 w. *Engineering Magazine—*March, 1909. No. 2784 B.

The Principle of the Time Ticket. L. S. Randolph. Discussion of methods of obtaining labor costs of pieces and operations. 2000 w. *Engineering Magazine—*May, 1909. No. 4342 B.

A System of Distributing Waste Losses in Raw Material to the Cost of Finished Products. L. W. Olsen. Indicates a method of distributing losses occurring in the melting and mixing of non-ferrous metals. 2000 w. *Am Brass Found Assn—*May 18, 1909. No. 5113 N.

A Cost System that Controls Costs. Herbert M. Rich. Explains the system of the Cleveland Automatic Machine Co. Ills. 3500 w. *Am Mach—*Vol. 32. No. 23. No. 5387.

A Factory Stock and Cost-Keeping System. Walter J. Spiro. Describes the plan adopted successfully by a manufacturing concern. 3500 w. *Sch of Mines—*April, 1909. No. 5901 D.

Foundry Costs. B. A. Franklin. Presents a system in operation that not only gives the cost of a casting, but shows the variation of the elements of manufacture.

Cost Systems

2500 w. Am Found Assn—June, 1909. No. 5605 N.

A Simple Foundry Production Tally. C. E. Knoeppel. Describes a practical cost system for the casting shop. 5000 w. Foundry—Aug., 1909. No. 6814.

Systematic Foundry Operation and Foundry Costing. C. E. Knoeppel. This third article of a series enumerates and classifies the elements entering into production costs. 5000 w. Engineering Magazine—Dec., 1908. No. 677 B.

Systematic Foundry Operation and Foundry Costing. C. E. Knoeppel. This fourth article of a series discusses the apportionment of various elements to production. 4000 w. Engineering Magazine—Jan., 1909. No. 1329 B.

Systematic Foundry Operation and Foundry Costs. C. E. Knoeppel. This fifth article of a series deals with apportioning costs to production in various classes of work. 4500 w. Engineering Magazine—Feb., 1909. No. 2156 B.

Systematic Foundry Operation and Foundry Costs. C. E. Knoeppel. This sixth article of a series deals with foundry organization and management. 3500 w. Engineering Magazine—March, 1909. No. 2786 B.

The Distribution of Foundry Tonnage Burdens. Victor R. Claydon. Brief discussion of an interesting problem in accurate determination of costs. 600 w. Engineering Magazine—Sept., 1909. No. 7421 B.

The Distribution of Foundry Tonnage Burden. F. L. Pinkham. A commentary on Mr. Victor R. Claydon's cost problem, with rejoinder. 700 w. Engineering Magazine—Nov., 1909. No. 8836 B.

See also Cost Keeping, under CIVIL ENGINEERING, CONSTRUCTION; Cost Keeping, under ELECTRICAL ENGINEERING, GENERATING STATIONS; and Management, and Time Keeping, under INDUSTRIAL ECONOMY.

Depreciation.

Depreciation. A. Winder. Suggestions on methods of determining the loss in value of machinery. 1000 w. Cassier's Mag—Feb., 1909. No. 2332 B.

Depreciation of Power Plant Equipment. F. H. Neely. Discussion of the subject which calls attention to the lack of uniformity of prevailing practice. 1150 w. Power—June 8, 1909. No. 5326.

Repairs, Renewals, Deterioration and Depreciation of Workshop Plant and Machinery. James Edward Darbishire. Suggestions for a system which shall provide

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for proper upkeep and replacement. 3300 w. Inst of Mech Engrs—Oct. 16, 1908. No. 18 N.

The Importance of the Depreciation Question in Industry (Die wirtschaftliche Bedeutung der Abschreibungsfrage für der Industrie). C. M. Lewin. A discussion of the practice of writing off a certain amount each year from plant value to cover depreciation. Ills. 2500 w. Zeitschr f Werkzeug—Dec. 15, 1908. No. 1983 D.

The Question of Depreciation in Manufacturing (Die Abschreibungsfrage in Industriebetrieben). A discussion of the fundamental principles in accounting for depreciation. Ills. 3500 w. Serial. 2 parts. Zeitschr f Werkzeug—March 15 and 25, 1909. No. 4285 each D.

Education.

Discussion on "A New Method of Training Engineers," and "The Relation of the Manufacturing Company to the Technical Graduate," Atlantic City, N. J., July 2, 1908. Papers by Magnus W. Alexander, and by David B. Rushmore are discussed. 7000 w. Pro Am Inst of Elec Engrs—Jan., 1909. No. 1363 F.

The Progress of Engineering Education. Robert W. Rogers. Gives an outline of the history of the development of structural engineering from its beginning to the present day. 7500 w. Sibley Jour of Engng—April, 1909. No. 5104 C.

Education for Utility and Culture. Dr. Calvin M. Woodward. Address at Missouri Sch. of Mines. Reviews the history of university development, and the field of human activities and culture. 4500 w. Eng News—June 24, 1909. No. 5864.

The Value of the Classics in Engineering Education. Charles P. Steinmetz. Considers the study of the classics important and valuable to engineers. 1500 w. Pro Am Inst of Elec Engrs—July, 1909. No. 6492 F.

Some Comments on Our Engineering Education and the Men It Produces. Abstract of a lecture by W. D. Taylor before the Engng. Club of the Univ of Illinois, and repeated at the Univ. of Wisconsin. 9000 w. Wis Engr—April, 1909. No. 5687 D.

Two Sides of University Life. Arthur Twining Hadley. Speech to the students of Johns Hopkins University, Feb. 22, 1909. 3500 w. Yale Sci M—June, 1909. No. 5686 C.

Present Tendencies in Technical Education. Frederick E. Turneure. Extract from presidential address to the Soc.

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for the Promotion of Engng. Education. Deals with the technical training needed. 1500 w. Eng News—July 1, 1909. No. 6089.

Practical Work for College Professors. Charles Buxton Going. Abstract of a paper read before the Soc. for Promotion of Engng. Education. Considers the need of more intimate knowledge of actual working conditions. 3000 w. Ir Trd Rev—July 1, 1909. No. 6111.

The Five-Year Courses. William T. Magruder. Read before the Soc. for Pro. of Engng. Ed. Presents the need of a lengthened course to meet the requirements of students paying their own way. 2000 w. Eng Rec—July 24, 1909. No. 6644.

The Training of Non-Technical Men. C. R. Dooley. Discusses the need of trained men, and the work of the apprenticeship system, and of the night school in the training of non-technical men. 2500 w. Pro Am Inst of Elec Engrs—Aug., 1909. No. 7057 F.

Discussion on "The Training of Non-Technical Men" and "The Value of Classics in Engineering Education." The papers by C. R. Dooley and by Charles P. Steinmetz, as discussed at Frontenac, N. Y. 10800 w. Pro Am Inst of Elec Engrs—Oct., 1909. No. 8542 F.

Why Manufacturers Dislike College Graduates. Frederick W. Taylor. Condensed report of Mr. Taylor's discussion of a paper on engineering education. 3500 w. Elec Jour—Sept., 1909. No. 7572.

Three Years of the Coöperative Courses. Herman Schneider. Reports the satisfactory operation of these engineering courses at the University of Cincinnati. 4000 w. Am Mach—Vol. 32. No. 36. No. 7700.

Industrial Education. Read before the Nat. Machine Tool Bldrs.' Assn. The Cincinnati plan is discussed by Frederick A. Geier; and the Fitchburg plan, by M. A. Coolidge. 2500 w. Ir Age—Oct. 14, 1909. No. 8547.

Training for Saving in Manufacturing. E. L. Shuey. Discusses preparation for their work of superintendents and engineers. 2200 w. Indus Engng—Oct. 15, 1909. No. 8577 B.

Training in the Engineering Trades in Philadelphia. Henry W. Spangler. Discusses present conditions and opportunities, and the trade-school training that should be provided. 7000 w. Pro Engrs' Club of Phila—April, 1909. No. 7115 D.

The Education and Organization of Railway Engineering Labor. J. E. Muhl-

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field. A study of the best preparation for success in this field—with general discussion. 12500 w. Pro N Y R R Club—Jan. 15, 1909. No. 2413.

Fundamental Principles of Industrial Education. Herman Schneider. Considers the problem, the field covered, the end to be attained and the general solution. 4000 w. Pro Am Inst of Elec Engrs—April, 1909. No. 3960 F.

Discussion on "Fundamental Principles of Industrial Education." New York, April 16, 1909. The paper by Herman Schneider is discussed. 12500 w. Pro Am Inst of Elec Engrs—Aug., 1909. No. 7060 F.

On the Systematic Training of Engineers: Are We Practical? Charles A. Bowman. Urges some acquaintance with practical engineering experience before entering a technical college. 2000 w. Can Engr—Jan. 22, 1909. No. 2015.

The Development of the Mechanical Engineer. George Frederic Stratton. Discusses the advantages of scientific training. 2000 w. Cassier's Mag—Feb., 1909. No. 2329 B.

The Practical Training of Mechanical Engineers. Franz zur Nedden. A comparison of German, English and American methods. 2500 w. Engineering Magazine—April, 1909. No. 3527 B.

Organization and Management of Trade Schools. John M. Shrigley. Address before the Nat. Soc. for Pro. of Ind. Ed. Gives the Experience of the Williamson Free School of Trades in developing journeymen mechanics. The instruction being by exercise work only. 450 w. Am Mach—Vol. 32. No. 3. No. 1867.

Industrial Education. H. F. Baillet. Paper read before the Association of Master Plumbers of N. J. Discusses the development and need of industrial education in the U. S. and the attitude of the master plumber. 1700 w. Met Work—June 5, 1909. No. 5361.

The Relative Positions of Manual Training, Trade Training and Technical Education. Brief discussion of the work of each and their relation to each other. 2000 w. Am Mach—Vol. 31, No. 46. No. 221.

The Relations Between Applied Chemistry and Engineering. John B. C. Kershaw. Discusses present tendency to combine these two branches and the necessity of training engineers in chemistry. 2700 w. Indus Engng—Oct. 15, 1909. No. 8579 B.

Education

The Training of Engineers. Inaugural address of Prof. Charles Frewen Jenkin delivered at Oxford Univ. 5000 w. *Mech Engr*—Nov. 13, 1908. No. 431 A.

The Rev. H. B. Gray's Address to the Educational Science Section of the British Association. (Abstract.) Discusses the educational factors of Imperialism. 3000 w. *Elect'n, Lond*—Sept. 3, 1909. No. 7730 A.

University Degrees in Engineering. J. A. Fleming. Considers the requirements and object of engineering education, and how far they are being met by British universities. 3500 w. *Engng*—Jan. 8, 1909. No. 1821 A.

The Defects of English Technical Education and the Remedy. Dr. Robert Pohl. Read before an Assn. of Teachers in Huddersfield. 4000 w. *Nature*—April 15, 1909. No. 4185 A.

The Commercial Training of the Engineer (*L'Instruction commerciale de l'Ingénieur*). Maurice Bellom. Discusses the need for training engineers in economic principles, languages, etc. 3000 w. *Génie Civil*—Nov. 21, 1908. No. 1124 D.

The Education of a Marine Engineer. W. E. Dalby. Reviews marine educational systems, particularly in England 3000 w. *Cassier's Mag*—Nov., 1908. (Special No.) No. 389 D.

The Scientific Education of Naval Architects. Prof. J. J. Welch. Reviews what has been done to insure the proper training of the British naval architect, especially considering the Admiralty systems. 9500 w. *Trans N-E Coast Inst of Engrs & Shipbldrs*—April, 1909. No. 4372 N.

Electrical Inventions and the Training of the Electrical Engineer. J. A. Fleming. Discourse delivered at University College, London. Suggestions and advice of interest to engineering students. 5000 w. *Elec Engr, Lond*—Oct. 8, 1909. No. 8856 A.

Mining Education in the British Empire. Considers the education of working miners, of mine captains and managers, and of mining engineers, giving general conclusions. 5500 w. *Min Jour*—April 3, 1909. No. 3903 A.

Technical and University Education (*L'Enseignement technique dans ses Rapports avec l'Enseignement universitaire*). Henry Le Chatelier. Reviews conditions in France. 3000 w. *Rev de Métal*—Oct. 1908. No. 517 E + F.

The Education of Youth and the Royal Naval Academy (*L'Educazione della Gioventù e la R Accademia Navale*). T.

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Rosati. A discussion of the conditions of naval engineering education in Italy. 13000 w. *Riv Marit*—Sept., 1909. No. 8634 E + F.

The Scientific Spirit and Education (*L'Esprit scientifique et l'Enseignement*). Paul Appel. Discusses the condition of scientific education in France. 3300 w. *L'Elec'n*—Feb. 6, 1909. No. 3331 D.

The Development of Higher Technical Education in France (*L'Orientation des Programmes de l'Enseignement supérieur technique en France*). Edmond Dayras. A review of the tendency to introduce economic courses. 4000 w. *Génie Civil*—Aug. 21, 1909. No. 7938 D.

The Education of Foundrymen in France (*Ausbildung von Giessereitechnikern in Frankreich*). C. Irresberger. Outlines the methods followed in the *Ecoles Nationales d'Arts et Métiers*. Ills. 2100 w. *Stahl u Eisen*—Jan. 27, 1909. No. 2666 D.

The Necessity of a Transformation in Mining Education (*Ueber die Notwendigkeit einer Umgestaltung des montanistischen Hochschulunterrichtes*). Albert Sailler. A discussion of mining education in Austria. 2800 w. *Oest Zeitschr f Berg u Hüttenwesen*—June 19, 1909. No. 6570 D.

The Employment of Models to Illustrate Important Mechanical Principles in Engineering Education (*Die Verwendung von Modellen zur Veranschaulichung wichtiger Sätze der technischen Mechanik im Hochschulunterricht für Maschineningenieure*). Eugen Meyer. Ills. Serial. 1st part. 6000 w. *Zeitschr d Ver Deutscher Ing*—Aug. 14, 1909. No. 8150 D.

Secondary Mining Schools in Austria. Herman Löcker. Explains the organization, method of support, and subjects taught in these schools, located in each mining district. 2000 w. *Mines & Min*—May, 1909. No. 4483 C.

The St. Regis Operating Engineers' Training School. Explains the object of the society, and methods. 5000 w. *Elec Age*—Feb., 1909. No. 2511.

The Hammond Mining and Metallurgical Laboratory of the Sheffield Scientific School, Yale University. Louis D. Huntoon. Illustrated detailed description of the building and its equipment. 4000 w. *Bul Am Inst of Min Engrs*—March, 1909. No. 3468 F.

The Hammond Mining and Metallurgical Laboratory. Louis D. Huntoon. Illustrates and describes the building and its equipment given by Prof. John Hays Hammond to the Sheffield Scientific

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School of Yale University. 2500 w. Yale Sci M—May, 1909. No. 4750 C.

Physical Chemistry and Electro-chemistry at the College of the City of New York. Leo Frank Guttman. Illustrated description of the laboratories and their equipment. 1500 w. Elec-Chem & Met Ind—April, 1909. No. 3663 C.

Electrical Laboratory Equipments of the College of the City of New York. W. M. Schoonmaker. Describes an extensive and elaborate arrangement of apparatus. Ills. 1500 w. Elec Wld—July 29, 1909. No. 6764.

The Rensselaer Polytechnic Institute and the Development of Engineering Education. Extracts from the address of Jesse M. Smith, at the dedication of the new Russell Sage laboratory building, 1200 w. Eng News—Aug. 19, 1909. No. 7137.

Lane Technical High School, Chicago. Explains the functions of this school, the studies and equipment, etc. Ills. 3500 w. Elec Wld—Aug. 26, 1909. No. 7354.

Dedication of the Swift Engineering Building at Northwestern University. Addresses made by John F. Hayford, and Charles Whiting Baker. Ills. 6500 w. Eng News—May 20, 1909. No. 4775.

Engineering at the University of Toronto. Walter J. Francis. Illustrates and describes the recent developments, new buildings, improved equipment and facilities for instruction. 3000 w. Engr, Lond—Jan. 29, 1909. Serial. 1st part. No. 2366 A.

The University of Birmingham. Illustrated description of the mining equipment and training. 4000 w. Col Guard—April 23, 1909. No. 4458 A.

The Birmingham University. C. Alfred Smith. Illustrated description of the buildings and their equipment, especially the recent developments. Plate. 6000 w. Engng—July 2, 1909. Serial, 1st part. No. 6304 A.

The Engineering Equipment of Birmingham University. Describes the new laboratories largely devoted to the various branches of applied science. 3500 w. Engr, Lond—June 25, 1909. No. 6284 A.

The Engineering Department of the Victoria University, Manchester. Reviews the progress of engineering education at this university, and gives illustrated description of the new laboratories. 2500 w. Engng—July 16, 1909. No. 6684 A.

The University of Sheffield: Department of Applied Science. Illustrated description of the buildings, and the work

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done. 2400 w. Col Guard—June 11, 1901. Serial. 1st part. No. 5654 A.

The Merchant Venturers' Technical College, Bristol. Illustrates and describes the electrical equipment of the new building. 2500 w. Elect'n, Lond—July 30, 1909. Serial, 1st part. No. 6979 A.

The New Engineering Laboratories and Workshops at the Heriot-Watt College, Edinburgh. Illustrations and descriptions of these new buildings in Edinburgh, and their equipment. 2000 w. Engng—Aug. 20, 1909. No. 7442 A.

Laboratory Instruction in Mechanical Engineering and the Laboratory of the Aachen Technical School (Der Laboratoriumsunterricht an Maschinenbauschulen und das Maschinenlaboratorium der Kgl. Höheren Maschinenbauschule zu Aachen). Herr Heim. Illustrated description of equipment. 4300 w. Zeitschr d Ver Deutscher Ing—Dec. 12, 1908. No. 2100 D.

Mining Education and the New Essen School (Das Bergschulwesen und das neue Bergschulgebäude in Essen). Herr Cabolet. Describes the new building and its equipment. Ills. 4000 w. Glückauf—May 15, 1909. No. 5758 D.

The College of Engineering of the Tokyo Imperial University. B. Arakawa. An account of this college and its work. 1800 w. Sib Jour of Engng—June, 1909. No. 5808 C.

Imperial Railways of North China Engineering and Mining College, Tang Shan. Illustrated description of an institution regarded as an important center for the introduction of Western science in China. 1600 w. Engng—June 18, 1909. No. 6040 A.

See also same title, under MARINE AND NAVAL ENGINEERING.

Eight-Hour Day.

The Eight-Hour Day in Practice. Considers the probable effect of the English Act that goes into operation July 1st in the collieries. 2500 w. Col Guard—May 7, 1909. No. 4724 A.

The Eight-Hour Day and Sunday Rest in Mining (Zur Enquete über den Achtstundentag und die Sonntagsruhe beim Bergbau). Heinrich Reif. A German view of the question. Serial, 1st part 1800 w. Oest Zeitschr f Berg- u Hüttenwesen—Oct. 10, 1908. No. 550 D.

Employers' Liability.

Employers' Liability for Accidents. Epaphroditus Peck. Extracts from an address before the Nat. Met. Trds. Assn Discusses possible changes in the existing

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Engineering

law. 2000 w. *Ir Age*—April 22, 1909. No. 4099.

Engineering.

Engineering Science and the "Practical Man" in Engineering. Antonio Llano. A criticism of the "practical" attitude of some engineers. 5500 w. *Eng News*—Aug. 19, 1909. No. 7140.

The Place of the Engineer in Public Life (*Die Stellung des Ingenieurs im öffentlichen Leben*). C. Buschkiel. A discussion of the relations of the engineer with the public. 7000 w. *Zeitschr d Ver Deutscher Ing*—Feb. 20, 1909. No. 3570 D.

Engineering Ethics.

The Ethics of the Engineering Profession. Benjamin B. Lawrence. Considers some of the questions that arise in the profession of mining engineering. 1500 w. *Sch of Mines Qr*—July, 1909. No. 7894 D.

Engineering Opportunities.

Some Opportunities on the Shop Side in the Engineering Industries. C. B. Auel. Discusses the specialization of modern manufacturing establishments. 3000 w. *Elec Jour*—Dec., 1908. No. 977.

Engineering Profession.

President's Address at the 41st Annual Convention of the American Society of Civil Engineers, Bretton Woods, New Hampshire. July 6, 1909. Onward Bates. Discusses "The Status of the Civil Engineer's Profession in the United States of America." 4500 w. *Pro Am Inst of Elec Engrs*—Sept., 1909. No. 8149 F.

The Engineer as a Cultured Specialist. Alex. C. Humphreys. Address delivered at the inauguration of President Sparks, of Penn. State College. 3500 w. *Stevens Ind*—Oct., 1908. No. 485 D.

The Engineer and the Engineer's Society. G. E. Flanagan. Address of retiring chairman, reviewing briefly what engineers have done and are doing. 3000 w. *Pro Engrs' Soc of W Penn*—March, 1909. No. 3816 D.

Why Engineers Do Not Take More Part in Government. Joseph R. Worcester. Addresses at meeting of Boston Society of Civil Engineers. 6000 w. *Jour Assn of Engng Socs*—March, 1909. No. 4907 C.

Presidential Address before the Engineering Section of the British Association at Winnipeg. Sir W. H. White. Deals principally with the service engineers have rendered in the development of Canada. 10500 w. *Can Engr*—Sept. 3, 1909. No. 7547.

Filing Systems

The Status of the Engineering Profession. G. Allan Thomas. Prize paper. Outlines a scheme by which the engineering profession might be maintained on an equality with other professions. 4500 w. *Soc of Engrs*—Oct. 4, 1909. No. 8764 N.

Engineering Societies.

The Engineer and the People. Discussion of Morris L. Cooke's paper on this subject. 7800 w. *Jour Am Soc of Mech Engrs*—March, 1909. No. 3463 F.

Experiment Station.

See Illinois Industries, under INDUSTRIAL ECONOMY.

Expositions.

The Alaska-Yukon-Pacific Exposition—The Fair That Was Ready. A. J. Quigley. An illustrated article outlining the plan, scope and results. 2500 w. *Engineering Magazine*—Aug, 1909. No. 6749 B.

Engineering Features of the Alaska-Yukon-Pacific Exhibition. Brief illustrated description. 800 w. *Eng News*—July 1, 1909. No. 6081.

The International Exposition at Nancy, 1909 (*L'Exposition internationale de Nancy, 1909*). A. Bidault des Chaumes. Describes interesting features of buildings and exhibits. Ills. 7200 w. *Génie Civil*—Aug. 7, 1909. No. 7932 D.

The Nancy Industrial Exposition, 1909 (*Die Industrieausstellung in Nancy, 1909*). Describes particularly the exhibits relating to the iron and steel industry. Ills. 3000 w. *Stahl u Eisen*—Aug. 18, 1909. No. 7952 D.

Filing Systems.

Card Systems in Engineering Works. Alfred B. Searle. The present number explains the object of card systems. 1500 w. *Mech Wld*—March 5, 1909. Serial. 1st part. No. 3157 A.

Filing and Indexing Data in the Office of the Chief Engineer of Elevated and Subway Construction, Boston Elevated Railway Company. Herbert C. Hartwell. Outlines the system of numbering, filing, and indexing data. 1200 w. *Jour Assn of Engng Socs*—Aug., 1909. No. 8061 C.

An Efficient Indexing System for a Civil Engineer's Office. Walter A. Brown. Describes a system evolved by the writer, similar in some respects to the decimal system designed by W. G. Taylor. 1500 w. *Eng News*—Sept. 2, 1909. No. 7538.

The Filing System of Records in the Engineering Department of Salt Lake.

INDUSTRIAL ECONOMY

Filing Systems

City. O. H. Skidmore. An explanation of the system. 2000 w. Jour Assn of Engng Socs—Aug., 1909. No. 8059 C.

Indexing Used in the Engineering Department of the Town of Brookline, Mass. Henry A. Varney. Describes a system devised in 1902 and still used. 1000 w. Jour Assn of Engng Socs—Aug., 1909. No. 8060 C.

A Specification for Filing and Indexing Railroad Plans. Herman K. Higgins. Outlines a system simple enough to allow of its use by unintelligent help and of wide adaptability. 5500 w. Jour Assn of Engng Socs—Aug., 1909. No. 8058 C.

See also Records, under STREET AND ELECTRIC RAILWAYS.

Finland.

The Development of the Industries of Finland. The first of a series of articles on the recent rapid development of Finland industries, reviewing earlier history. 4000 w. Engr, Lond—Sept. 3, 1909. Serial. 1st part. No. 7756 A.

Fire Loss.

See Natural Resources, under INDUSTRIAL ECONOMY.

Franchisees.

How New York City Submits Applications for Public Service Franchises to an Engineering Department. With a report of the Franchise Division on an application and an editorial. 7000 w. Eng News—Feb. 11, 1909. No. 2394.

Great Britain.

The Engineering Industries. Extracts from the Tariff Commission Report. 3000 w. Engng—Jan. 29, 1909. Serial. 1st part. No. 2364 A.

Illinois Industries.

The Engineering Experiment Station and Its Relation to Illinois Industries. L. P. Breckenridge. Explains the great resources of this state, outlining their development, and showing graphically and by charts the growth and general advancement. Also an illustrated account of the work of the engineering experiment station of the University of Illinois and its influence. Discussion. 12800 w. Jour W Soc of Engrs—Aug., 1909. No. 7423 D.

Industrial Betterment.

Environment and Its Effects on Workmen and Their Work. Frank Somers. Read before the Birmingham Assn. of

Inventions

Mech. Engrs. Ills. 1800 w. Ir & Coal Trds Rev—Feb. 5, 1909. No. 2497 A.

See also Welfare Work, under RAILWAY ENGINEERING, MISCELLANY; and Welfare Work, under MINING AND METALLURGY, MINING.

Industrial Districts.

The Centering of Great Industries in the New York Metropolitan District. Dr. Charles F. McKenna. Extracts from a paper at meeting of the Am. Inst. of Chem. Engrs. Gives statistics showing the importance of this district and discusses steps that would lead to the best development and advancement. 5000 w. Elec-Chem & Met Ind—Aug., 1909. No. 6822 C.

Industrial Legislation.

Proposed Workmen's Compensation Act in New York. Gives the substance of a bill relating to compensation to workmen for accidental injuries in the course of employment. Also editorial. 2000 w. R R Age Gaz—Feb. 5, 1909. No. 2302.

The Home Office and Ship-platers Wage Rates. Editorial on some of the disadvantages of hasty and ill-considered legislation when applied to commerce and industry. 1500 w. Engng—Sept. 24, 1909. No. 8366 A.

Some Medical and Insurance Problems Arising Out of Recent Industrial Legislation. Thomas Oliver. Some effects of the Workmen's Compensation Acts in Great Britain are discussed. 5000 w. Col Guard—Nov. 20, 1908. No. 736 A.

Industrial Museums.

The Transportation and Construction Museum in Berlin (Ueber das Kgl. Verkehrs- und Baumuseum in Berlin). E. A. Ziffer. Describes the building and exhibits. Ills. 5200 w. Mitt d Ver f d Ford d Local u Strassenbahnwesens—May, 1909. No. 6559 F.

A Visit to the German Museum in Munich (Ein Besuch im Deutschen Museum in München). Conrad Matschoss. Brief notes on a large number of exhibits. Ills. Serial. 1st part. 3600 w. Zeitschr d Ver Deutscher Ing—Sept. 18, 1909. No. 8915 D.

Inland Navigation.

Utility of Waterways as a Factor in Transportation. J. A. Ockerson. An address before the River and Harbor Convention. 4000 w. Eng Rec—Dec. 19, 1908. No. 1055.

Inventions.

Salient Points for Inventors—Making and Preserving Records. John D. Mor-

Kashmir

gan. Suggestions for recording evidence of first invention. 2000 w. Am Mach—Vol. 31. No. 52. No. 127&.

See also Patents, under INDUSTRIAL ECONOMY.

Kashmir.

Kashmir. Concerning a proposed scheme for the industrial development of this beautiful valley of British India. 3000 w. Engr, Lond—Feb. 12, 1909. No. 2700 A.

Labor.

The Unemployed in European Countries. W. D. P. Bliss. Information and discussion from a bulletin issued by the American Bureau of Labor. Considers what European countries have accomplished, and the work in progress. 5000 w. Ir & Coal Trds Rev—May 7, 1909. Serial. 1st part. No. 4731 A.

Arbitration in Railway and Engineering Labor Disputes. Editorial on the settlement, through arbitration, of points of difference between the L. & N.-W. Ry. Co. and its employes, with discussion of the general system of arbitration. 2500 w. Engng—Feb. 12, 1909. No. 2595 A.

See also Nicaragua, under CIVIL ENGINEERING, MISCELLANY.

Labor Arguments.

The Shipbuilding Trades' Agreement. Text of the agreement made with the view of settling trade disputes without stoppage of work. Also editorial. 3000 w. Engng—Jan. 15, 1909. No. 2078 A.

Labor Insurance.

Insurance against Unemployment (Les Caisses d'Assurances contre le Chomage). P. Maurice. A general discussion of the problems of unemployment. Ills. Serial. 1st part. 4000 w. Génie Civil—Dec. 5, 1908. No. 1926 D.

Insurance Against Unemployment (L'Assurance contre le Chomage). Maurice Bellom. A comment on M. P. Maurice's articles on this subject in *Le Génie Civil* for Dec. 5, 1908, *et seq.* 3200 w. Génie Civil—Jan. 16, 1909. No. 2642 D.

The Insurance and Pensioning of Employes in Austria. An examination of the three Austrian Acts of Parliament which deal with these matters. 4500 w. Engng—April 30, 1909. No. 4623 A.

Labor Insurance in Germany (Aus den Ergebnissen der Statistik der deutschen Arbeiterversicherung). Otto Graf. Summary of statistics showing the cost and results of labor insurance. Ills. Serial. 1st part. 2400 w. Technik u Wirtschaft—July, 1909. No. 7472 D.

Management

Contributions to the Operation of the Accident Insurance System and the Fixing of Risks and Premiums (Die Beiträge der Betriebe zur Unfallversicherung und das Gefahrentarifwesen). Konrad Hartmann. Discusses the operation of the German system of labor insurance. 3500 w. Tech u Wirt—Aug., 1909. No. 8153 D.

A Project for a National System of Labor Insurance (Bemerkungen zum Entwurf einer Reichsversicherungsordnung). Otto Graf. Discussion of conditions and prospects of labor insurance in Germany. Ills. 5000 w. Tech u Wirt—Sept., 1909. No. 8912 D.

Labor Unions.

The Trade Union Movement. John Mitchell. Speech to the students of the Yale Divinity School. A discussion of the industrial problem and the work of organized labor unions. 4500 w. Yale Sci M—Oct., 1909. No. 8765 C.

Management.

The Basic Cause of Increased Efficiency. Walter M. McFarland. Argues that increased efficiency is to be obtained principally through the stimulation of the human element by rewards. 3000 w. Engineering Magazine—Dec., 1908. No. 668 B.

Efficiency as a Basis for Operation and Wages. Harrington Emerson. This sixth article of a series discusses the modern theory of cost accounting. 5000 w. Engineering Magazine—Dec., 1908. No. 669 B.

Efficiency as a Basis for Operation and Wages. Harrington Emerson. The location and elimination of wastes is discussed in this seventh article of a series. 3000 w. Engineering Magazine—Jan., 1909. No. 1333 B.

Efficiency as a Basis for Operation and Wages. Harrington Emerson. This eighth article of a series discusses the efficiency system in operation. 4000 w. Engineering Magazine—Feb., 1909. No. 2161 B.

Efficiency as a Basis for Operation and Wages. Harrington Emerson. Ninth and last of a series of papers on efficiency ideals and practice, discussing what the system may accomplish. 2000 w. Engineering Magazine—March, 1909. No. 2789 B.

Organization by Production Factors. A. Hamilton Church. This part of a series of articles on production costs, considers factors other than labor. 4500 w. Engineering Magazine—Oct., 1909. No. 8171 B.

Management

Organization by Production Factors. A. Hamilton Church. This second article of a series discusses production factors as related to cost accounts and staff. 4500 w. *Engineering Magazine*—Nov., 1909. No. 8831 B.

Increasing Production by the Premium System. T. A. Sperry. Discusses the essentials of a successful system. 5500 w. *Am Mach*—Vol. 32, No. 5. No. 2257.

A Test of the Application of the Taylor System in a Large French Works (*Quelques Notes sur un Essai d'Application du Système Taylor dans un Grand Atelier de Mécanique Français*). Georges de Ram. Brief note on the general results. 2000 w. *Rev de Métal*—Sept., 1909. No. 8604 E + F.

A Simple but Effective System for an Engineering Works. Frederick C. Herlan. Outlines a system adopted in an English factory. 2500 w. *Ind Engng*—July 15, 1909. No. 6676 C.

The Importance of System in Manufacturing Enterprises. Oscar E. Perrigo. Shows the necessity of system, discussing conditions to be considered and giving helpful suggestions. 5500 w. *Ir Trd Rev*—Sept. 9, 1909. No. 7677.

Training Workmen in Habits of Industry and Coöperation. H. L. Gantt. Outlines a system discussing the application, obstacles, etc. 4500 w. *Jour Am Soc of Mech Engrs*—Mid-Nov., 1908. No. 652 F.

Some Suggestions of Reform in Engineering Practice. J. E. Livermore. Suggestions for improvement in manufacturing and commerce. 5000 w. *Cassier's Mag*—March, 1909. Serial. 1st part. No. 2926 B.

The Organization of Small Engineering Works. W. O. Horsnaill. Shows the importance of cost-keeping, systematic methods of work, etc., in the present number. 2200 w. *Mech Wld*—Jan. 1, 1909. Serial. 1st part. No. 1529 A.

Training Workmen in Habits of Industry and Coöperation. H. L. Gantt's paper is discussed. 9500 w. *Jour Am Soc of Mech Engrs*—Feb., 1909. No. 2407 F.

Staff Organization in Large Manufacturing Plants. W. H. A. Robertson. Points out inefficiencies due to indefiniteness of authority and the overlapping of duties. 1000 w. *Ir & Coal Trades Rev*—Nov. 6, 1908. No. 329 A.

Securing the Co-operation of the Workman in the Improvement of Workshop Methods, etc. R. W. Kenyon. Abstract of paper before the British Found. Assn. Gives an outline of the scheme in opera-

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tion at Accrington and discusses the subject generally. 6500 w. *Mech Engr*—Oct. 23, 1908. No. 69 A.

Graphical Helps for Apportioning Time in Constructive Operations. Herbert F. Stimpson. Considers exact predetermination as necessary for time as for material. 2000 w. *Engineering Magazine*—Sept., 1909. No. 7419 B.

Engineering Training and Workshop Organization. Joseph H. Stubbs. Presidential address before the Manchester Assn. of Engrs. A discussion of engineering efficiency and methods and systems by which it may be obtained. 3000 w. *Mech Engr*—Oct. 15, 1909. Serial. 1st part. No. 8883 A.

The Profit-Earning Casting Plant. H. Cole Estep. Calls attention to possible economies. Ills. 2000 w. *Foundry*—Nov., 1908. No. 58.

An Automatic Follow-Up System. Read before the Phila. Found. Assn. Describes a system of keeping records of orders in the foundry and laying out work for the moulders. 2500 w. *Foundry*—Dec., 1908. No. 759.

A Comprehensive Foundry Production Tally. C. E. Knoepfel. Outlines a method for collecting the principal production and cost figures. 5000 w. *Am Found Assn*—June, 1909. No. 5606 N.

Effective Organization in the Assembling Department. Alfred Spangenberg. Outlines a system recommended. 2500 w. *Am Mach*—Vol. 32. No. 13. No. 3652.

Systematized Foundry Management and Foundry Costs (*Systematisierte Giessereibetriebe und die hierbei in Ansatz zu bringenden Betriebskosten*). W. Heym. A discussion of the fundamental principles of foundry management. Serial. 1st part. 1800 w. *Giesserei-Zeit*—May 1, 1909. No. 5764 D.

See also *Accounting, Cost-Systems, Depreciation, Time Keeping, Wages, and Wage Systems*, under **INDUSTRIAL ECONOMY**; *Management*, under **RAILWAY ENGINEERING, MISCELLANY**; *Drafting Rooms*, under **MECHANICAL ENGINEERING, MACHINE ELEMENTS AND DESIGN**; *Shops and Shop Practice*, under **MECHANICAL ENGINEERING, MACHINS WORKS AND FOUNDRIES**; *Steel Works*, under **MINING AND METALLURGY, IRON AND STEEL**; and *Management*, under **RAILWAY ENGINEERING, MISCELLANY**.

Marine Transport.

Comprehensive Report on Waterway and Maritime Conditions Throughout

Marine Transport

the World—Strong Plea for American Ships. C. M. Chester. Special report to National Rivers and Harbor Congress. 3000 w. Naut Gaz—Dec. 24, 1908. No. 1259.

Japan Winning the Pacific. Edward G. Bogart. Discusses the probability of Japan winning because of cheap ships, cheap labor, and cheap food. 3500 w. World's Work—Nov., 1908. No. 29 C.

Japanese Shipping and Ship-Building Subsidies. A discussion of the new law enacted by the Diet which makes the amount payable in subsidies less than during the past year or two. 1200 w. Engng—April 30, 1909. No. 4621 A.

Natural Resources.

The New Union Among the States. W. J. McGee. Discusses the movements for the conservation of the natural resources of the United States, and the interdependence of the states in the work. 3000 w. Am Rev of Revs—March, 1909. No. 2917 C.

The North American Conference on the Conservation of Natural Resources. Gives the "Declaration of Principles" adopted, with introductory statement. 2500 w. Eng News—March 4, 1909. No. 3000.

Our National Resources, Their Conservation and Utilization. John Birkinbine. A discussion of some of these resources and their proper conservation and wise utilization. 7500 w. Jour Fr Inst—Jan., 1909. No. 1846 D.

The Conservation Idea as Applied to the American Society of Mechanical Engineers. M. L. Holman. Presidential address, 1908, discussing plans of this problem. 12500 w. Jour Am Soc of Mech Engrs—Jan., 1909. No. 1849 F.

How May the First Steps in Conservation be Taken? Editorial on the prevention of waste of mineral wealth, giving abstracts of two papers showing the waste in the oil fields. 3000 w. Eng News—Jan. 7, 1909. No. 1641.

Report of the National Conservation Commission and Accompanying Message of President Roosevelt. All the inventory portion of the report, with an abstract of the remainder. 6500 w. Eng News—Jan. 28, 1909. No. 2153.

The Conservation of Natural Resources by Legislation. R. W. Raymond. Discusses some of the dangers of legislative conservation, and related matters. 6500 w. Bul Am Inst of Min Engrs—May, 1909. No. 5006 F.

The "Conservation" Meeting of the National Engineering Societies. A report of

Natural Resources

the March 24th meeting of the four societies to consider questions in connection with the conservation of the natural resources. Condensed papers. 9000 w. Eng News—April 1, 1909. No. 3762.

The Need for Conserving the Mineral Wealth of the United States. Report submitted by the Minerals Section of the National Conservation Commission to the Conference on Dec. 9. 2000 w. Eng News—Dec. 17, 1908. No. 985.

The American Institute of Mining Engineers and the Conservation of Natural Resources. John Birkinbine. Discusses this subject, giving instances of progress already made and the aid given by the Institute discussions in promoting conservation. 2500 w. Bul Am Inst of Min Engrs—April, 1909. No. 4087 F.

Annual Address of the President. Hon. J. H. Richards. A discussion of natural resources and the waste in mining, indicating the work of the American Mining Congress. 4500 w. Pro Am Min Cong—1908. No. 4117 N.

Introductory Address at Meeting of Engineers in New York, March 24, 1909. Dr. James Douglas. 1200 w. Bul Am Inst of Min Engrs—May, 1909. No. 5004 F.

Conservation of Natural Resources. Jas. Douglas. A review of recent progress in copper smelting, blast-furnace practice, and other industries. 5500 w. Bul Am Inst of Min Engrs—May, 1909. No. 5000 F.

Conservation of Mineral Resources. J. B. Zerbe. Remarks on the pressing need of attention to this subject, especially considering coal. 1200 w. Pro Am Min Cong—1908. No. 4133 N.

A Rational Basis for the Conservation of Mineral Resources. Joseph A. Holmes. Discusses the proper basis for such conservation, what may be accomplished, etc. 3000 w. Bul Am Inst of Min Engrs—May, 1909. No. 5003 F.

Production and Waste of Mineral Resources. J. A. Holmes. A brief consideration of the production, consumption and waste in the United States, and the prevention of the waste. 4500 w. Min Wld—Oct. 2, 1909. No. 8313.

The Conservation of Water. John R. Freeman. Discusses some misapplications of the doctrine of forest influence on stream flow, and other features of the conservation movement. 5000 w. Bul Am Inst of Min Engrs—May, 1909. No. 5005 F.

Forest Potentialities of the South. W. W. Ashe. Information concerning the value of the forest products, and their

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present condition. 2200 w. Mfrs Rec—Feb. 25, 1909. No. 2744.

Electricity and the Conservation of Energy. Lewis B. Stillwell. Read at a joint meeting of Engineering Societies held in New York, March 24, 1909. Illustrates the function of electricity in the conservation of natural resources, summarizing the present power requirements in the United States, and the water power available, and related matters. Also discussion. 9000 w. Pro Am Inst of Elec Engrs—May, 1909. No. 4993 F.

Chemistry and the Conservation of Our Forests and Minerals. Marston Taylor Bogert. Part of the author's presidential address on "The Function of Chemistry in the Conservation of Our Natural Resources." 10000 w. Sch of Mines Qr—April, 1909. No. 5899 D.

The Waste of Our Natural Resources by Fire. Charles Whiting Baker. Discusses statistics of waste due to fires. 2000 w. Bul Am Inst of Min Engrs—May, 1909. No. 5007 F.

The Conservation Controversy. Herman B. Walker. A critical review of the movement in the United States. 5000 w. Power—Oct. 5, 1909. No. 8320.

President Taft on Conservation and the Work of the Reclamation Service. From an address delivered at Spokane, Wash., explaining the policy of the administration. 2200 w. Eng News—Oct. 7, 1909. No. 8406.

The Conservation of the Resources of Minnesota. F. H. Bass. A discussion of some of the problems that must be solved by engineers in this connection. 3500 w. Minn Engr—March, 1909. No. 4062 C.

See also Incandescent Lamps, under ELECTRICAL ENGINEERING, LIGHTING; and Conservation, under MINING AND METALLURGY, COAL AND COKE.

Panama Canal.

See same title, under CIVIL ENGINEERING, WATERWAYS AND HARBORS.

Patents.

The American Patent Law. John D. Morgan. Discusses its attitude toward inventors. 2500 w. Ir Age—Nov. 5, 1908. Serial, 1st part. No. 87.

Making Inventions and Getting Patents. John D. Morgan. A statement of facts in regard to the patent situation, and a discussion of improvements needed. 1200 w. Ir Trd Rev—March 18, 1909. Serial, 1st part. No. 3233.

Our Antiquated Patent System. Ludwig Gutmann. A critical discussion of

Peru

features of the patent laws of the United States. 2000 w. Elec Wld—Dec. 26, 1908. No. 1288.

A Phase of the Patent Situation. James T. Barkelew. Suggests the adoption of a system of taxation, or compulsory working, or both, to correct the unfavorable conditions now existing. 3500 w. Elec Wld—March 18, 1909. No. 3227.

The Patent Situation. Gorham Crosby. A criticism of statements made by James T. Barkelew in regard to the United States patent laws. 1800 w. Elec Wld—April 8, 1909. No. 4433.

The Patent System in Its Relation to Industrial Development. Frederick P. Fish. Calls attention to some of the underlying principles of the United States patent policy, showing how they seem to work in practice. 10000 w. Pro Am Inst of Elec Engrs—May, 1909. No. 4998 F.

Discussion on "The Patent System in Its Relation to Industrial Development." New York, May 18, 1909. Discusses Frederick P. Fish's paper. 5000 w. Pro Am Inst of Elec Engrs—Aug., 1909. No. 7061 F.

Inventing and Patenting—A Will o' the Wisp. L. P. Alford. Gives results of an investigation which shows the average cost of a patent to be \$570, and that less than one invention in four pays back the cost. 4000 w. Am Mach—Vol. 32, No. 31. No. 6894.

The New British Patent Laws in Operation. A review of the practical results of the recent enactment. 2000 w. Cassier's Mag—April, 1909. No. 3638 B.

Notes on Patent Licenses and Manufacturing Agreements. Theodore Rich. Discusses questions arising between patentee and manufacturer, with special reference to engineering and electrical work. 3500 w. Elec Rev, Lond—Jan. 1, 1909. No. 1695 A.

See also Western Railroad Association, under RAILWAY ENGINEERING, MISCELLANY.

Pension Systems.

A Pension System Embracing all Classes of Labor (Un Système de Réalisation possible de Retraites pour tous les Travailleurs). Léon Dargouge. Suggests an old-age pension system applicable to conditions in France. 3500 w. Rev d'Econ Indus—Aug. 16, 1909. No. 7900 D.

Peru.

The Resources of the Peruvian Andes and Amazon. C. Reginald Enock. An interesting description of this country, its natural resources and products. 7000 w.

Profit Sharing

Jour Soc of Arts—April 30, 1909. No. 4595 A.

Profit-Sharing.

Profit Sharing. Papers by R. T. Crane and by N. O. Nelson, read at N. Y. meeting of the Nat. Met. Trds. Assn. 3500 w. Ir Age—April 22, 1909. No. 4100.

Co-Partnership in Coal Mining. Describes the extension by Sir Christopher Furness of his co-partnership proposals from the ship-yards to the coal mining industry. 2700 w. Ir & Coal Trds Rev—May 28, 1909. No. 5410 A.

See also Co-Partnership, under INDUSTRIAL ECONOMY.

Public Utilities.

Equitable Rate-Making by Public Service Companies. Dugald C. Jackson. A discussion of the problems of appropriately fixing rates, and the test of their equitableness. 10500 w. Tech Qr—Dec., 1908. No. 3439 E.

A Dividing Scale for Charging for Public Utilities. W. D. Marks. Presents the writer's solution of this problem. 1200 w. Eng News—Aug. 26, 1909. No. 7360.

Purchasing.

The Purchase of Pattern Lumber. Oscar E. Perrigo. Suggestions for effecting economies in the purchase and care of raw material for the pattern shop. Ills. 5000 w. Foundry—Dec., 1908. No. 758.

Records.

See Record Systems, under CIVIL ENGINEERING, CONSTRUCTION.

Review of 1908.

Retrospect of the Year 1908. A review of the industrial activity in civil engineering, naval and military, merchant marine, electricity, etc. 6500 w. Sci Am—Jan. 2, 1909. No. 1428.

Siberia.

Siberia. Henry G. Read. Reviews the industrial and commercial resources of northern Asia. Ills. 5500 w. Cassier's Mag—Sept., 1909. No. 7776 B.

Standardization.

Standardization and Its Relation to the Trade of the Country. Sir John Wolfe Barry. A lecture delivered before the Inst. of Engrs. & Shipbldrs. in Scotland. On the work of the Engineering Standards Committee and its benefits. 8000 w. Engng—Jan. 29, 1909. No. 2365 A.

Standardization and Its Influence on Engineering Industries. William Cawthorne Unwin. The substance of two

Tariff

lectures before students of the Inst. of Civ. Engrs. Discusses what is required, the advantages, etc. Ills. 14000 w. Inst of Civ Engrs—Vol. CLXXXVII. Part III. No. 8164 N.

Standardization in Engineering. Henry Adams. Presidential address before the Assn. of Engineers-in-Charge. 5000 w. Elec Engr, Lond—Oct. 15, 1909. No. 8860 A.

Stores Keeping.

Stores Keeping in Industrial Plants (Behandlung von Bestellungen im Fabrikbetriebe). C. M. Lewin. Outlines the principles and a system. Ills. 4000 w. Zeitschr f Werkzeug—May 25, 1909. No. 5787 D.

See also Management, under RAILWAY ENGINEERING, MISCELLANY.

Strikes.

Employer's Insurance 'Against Strikes. Editorial on the conditions and the object of the Mutual Industrial and Commercial Fund which has been established in the North of France. 3000 w. Engng Jan. 29, 1909. No. 2362 A.

Tariff.

Tariff Hearings at Washington. A summary of the statements on the metal schedule. 33000 w. Ir Age—Nov. 26, 1908. Serial. 1st part. No. 788.

The Payne Tariff Bill. Text of the metal schedule of the tariff bill introduced in the House of Representatives, March 17, 1909. 6000 w. Ir Age—March 18, 1909. No. 3212.

Iron and Steel Duties in the Payne Tariff Bill. Discusses the significance of the more important changes. 3000 w. Ir Age—March 25, 1909. No. 3484.

The Payne Tariff Bill Passes the House. Gives the changes from the original draft. 3500 w. Ir Age—April 15, 1909. No. 3937.

The Senate Substitute Tariff Bill. Official text of the metal schedule of the Senate Finance Committee bill, reported to the Senate April 12. 8000 w. Ir Age—April 15, 1909. No. 3936.

The Metal Schedule as Revised by the Senate. The complete text of Schedule C of the new tariff bill, showing the changes the Senate has made in the Payne bill as passed by the House of Representatives. 9000 w. Ir Age—July 8, 1909. No. 6216.

The Metal Schedule in Its Final Shape. Gives the text of Schedule C of the new tariff bill. 7800 w. Ir Age—Aug. 5, 1909. No. 6893.

Tariff

Tariff Duties Compared. A comparison of the metal duties in the Dingley act with those in the new law. Also other provisions of interest to the metal trades. 6000 w. *Ir Age*—Aug. 12, 1909. No. 7000.

The Tariff Law of 1909. H. Parker Willis. A study of its effect on the side of administration and international relationships. 6000 w. *Jour of Acc*—Sept. 1909. No. 8503 C.

A New Tariff for the Philippines. Gives the schedules covering metals and manufactures thereof and instruments, apparatus, machinery, vehicles, boats, etc. 3500 w. *Ir Age*—April 22, 1909. No. 4102.

I. Tariff Revision from the Manufacturer's Standpoint. Dr. A. B. Farquhar, and II. H. E. Miles; III. From the Importer's Standpoint. Francis E. Hamilton. IV. From the Consumer's Standpoint. Jesse E. Orton. V. A Permanent Tariff Bureau. Seymour C. Loomis. Papers presented before the American Association for the Advancement of Science, at Baltimore. 12500 w. *Pop Sci M*—May, 1909. No. 4406 C.

The Benefits of Protective Duties. Abstract of address by Col. Albert Clarke before the Phila. Found. Assn. Discusses the necessity of continued protection to American manufacturers. 2000 w. *Ir Age*—April 15, 1909. No. 3935.

The Neutral Line. Henry R. Towne. From a paper read before the Tariff Commission Convention. A plea for scientific regulation of the tariff. 2500 w. *Ir Age*—Feb. 25, 1909. No. 2745.

Proposed New French Tariffs on Iron and Steel. Gives the important changes that have been recommended, with editorial comment. 3000 w. *Ir & Coal Trds Rev*—Feb. 5, 1909. No. 2496 A.

Technical Journalism.

Technical Journalism. Ray Morris. An address before the engineering students of the University of Michigan, explaining the growing importance of technical literatures and the opportunities for engineers. 6500 w. *R R Age Gaz*—April 30, 1909. No. 4367.

Time Keeping.

Something New in Machine-Shop Time-Keeping. Illustrates and describes a system where the data are telephoned to the office and recorded by aid of the calculator, without the workman leaving his machine. 1200 w. *Am Mach*—Vol. 31. No. 52. No. 1276.

See also Cost Systems, under **ELECTRICAL ENGINEERING, GENERATING STATIONS.**

Wage Systems

Trusts.

The State and the Trusts (Staat und Kartelle). Hugo Bonikowsky. Discusses the proposal for state regulation of the trusts in Germany, with special reference to the "kartelle" in the iron industry. 5500 w. *Stahl u Eisen*—Dec. 9, 1908. No. 1941 D.

Unemployment.

The Role of State and Municipality in Unemployment Insurance (Du Rôle de l'Etat et des Communes en Matière d'Assurances contre le Chômage). Paul Vergasi. A general discussion of the problem, with description of a number of schemes being tried in France. 3500 w. *Rev d'Econ Indus*—May 16, 1909. No. 5701 D.

Unemployment and Its Insurance (Arbeitslosigkeit und Arbeitlosen-Fürsorge). Erich Böer. Discusses the problems of unemployment and describes a number of schemes for its relief. 6500 w. *Schiffbau*—May 12, 1909. No. 5772 D.

Wages.

Systems of Wages and Their Influence on Efficiency. Carl Bender. Shows the nature, effect and limits of the best known wage systems. 4000 w. *Engineering Magazine*—Dec., 1908. No. 680 B.

Rate Fixing Confined to the fixing of rates in the molding and smithy department, and the erecting or assembling departments. 2000 w. *Mech Wld*—Jan. 8, 1909. No. 1814 A.

Wage Systems.

Wage Systems. Robert Goldmann. From a paper presented before the Nat. Met. Trds. Assn. Brief review of the various systems and the objections to them. 2500 w. *Ir Age*—April 29, 1909. No. 4328.

Added Rewards to Workmen. A new plan of the Lodge & Shipley Machine Tool Company explained. 2000 w. *Ir Age*—Feb. 11, 1909. No. 2388.

The Advantage of the Bonus System and Suggestions to Contractors Who Contemplate Applying It. 1200 w. *Engng-Con*—March 17, 1909. No. 3234.

The Premium System in a Large Jobbing Shop. T. A. Sperry. Outlines a successful application that effected great reduction in shop costs. 3500 w. *Am Mach*—Vol. 32. No. 7. No. 2515.

The Premium System of Paying Workmen. F. C. Blanchard. From a paper before the Nat. Metal Trds. Assn. Describes methods used in lighter manufacturing in the cases of both individual and

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gang operations. 2000 w. *Ir Age*—May 6, 1909. No. 4511.

The Premium System of Wage Payment. C. B. Lord. Read before the Nat. Met. Trds. Assn. Discusses some of the difficulties attending its application. 4500 w. *Am Mach*—Vol. 32. No. 30. No. 6761.

Some Notes on Engineering Premium Systems. Describes systems introduced in old works which changed losses to profits. 1700 w. *Mech Wld*—June 18, 1909. Serial, 1st part. No. 6038 A.

A Double-Rate Premium Plan. H. F.

Battleships

MacLane. Briefly considers other wage systems, and describes and illustrates the double-rate plan. 3000 w. *Am Mach*—Vol. 32. No. 29. No. 6612.

The Piece Work System. J. A. Gohen. Abstract of a paper describing operation of piece work system in railways, read before the Central Electric Railway Association. 1500 w. *Elec Ry Jour*—June 5, 1909. No. 5256.

See also Management, under RAILWAY ENGINEERING, MISCELLANY; and Car Maintenance, under STREET AND ELECTRIC RAILWAYS.

MARINE AND NAVAL

Admiral Melville

Admiral Melville.

George Wallace Melville. Walter M. McFarland. A tribute to his services to engineering and engineers. 1000 w. *Engineering Magazine*—May, 1909. No. 4345 B.

Ammunition.

Smokeless Powder. Conclusions of the Commission appointed to investigate the disaster on the Jena. 2500 w. *Engng*—Oct. 30, 1908. No. 193 A.

The Progressive Decomposition of Gun-Cotton During Its Storage. M. M. O. Silberrad and R. C. Farmer. Gives results of researches on the decomposition of gun-cotton. 2500 w. *Jour Fr Inst*—Dec., 1908. No. 971 D.

Armor.

Armor and Projectiles (Corazze e Proietti). E. Bravetta. A discussion of Capt. Tresidder's paper "Modern Armour and its Attack," read before the Inst. of Nav. Archts. Ills. 15000 w. *Riv Marit*—April, 1909. No. 4843 E + F.

Armorclads.

The First Sea-Going Armorclads. An illustrated account of the rapid development of armorclad vessels, the first having been built only about fifty years ago. 4000 w. *Int Marine Engng*—Sept., 1909. No. 7615 C.

Barges.

Reinforced Concrete Boats. H. Prime Kieffer. Illustrates and describes a construction coming into extensive use in Italy. 2200 w. *Int Marine Engng*—Aug., 1909. No. 7117 C.

Reinforced Concrete Barges and Pontons (Chalandes et Pontons en Ciment armé). E. Lemaire. Describes boats of reinforced concrete built on the Tiber. Ills. 3000 w. *Génie Civil*—Feb. 6, 1909. No. 3337 D.

Battleships.

The Design of Modern Warships. Prof. J. J. Welch. Outlines developments affecting warship design and some types of war vessels, tracing the progress and reviewing the principles underlying their

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design. Ills. 8500 w. *Cassier's Mag*—Nov., 1908. (Special No.) No. 385 D.

A Measure of the Values of Warships. Sidney G. Koon. An illustrated article discussing a comparative basis for the military value of naval vessels. 1500 w. *Cassier's Mag*—Nov., 1908. (Special No.) No. 395 D.

Monster Battleships. Sidney Graves Koon. Discusses the recent increase in size, especially the U. S. vessels of 26000 tons each, to be built at a cost of \$9,500,000 per vessel. 1500 w. *Int Marine Engng*—May, 1909. No. 4493 C.

The World's Seventy Dreadnoughts. Archibald S. Hurd. An illustrated discussion of the struggle for supremacy among naval powers. 4000 w. *Cassier's Mag*—May, 1909. No. 4400 B.

International Competition in Battleship Design. Editorial on the designs of different nationalities, submitted to the Spanish Government. 3000 w. *Engng*—July 16, 1909. No. 6685 A.

The Visiting Warships—A Comparison. A criticism of the naval parade of the Hudson-Fulton celebration, with illustrations and a comparison of the warships assembled. 2000 w. *Sci Am*—Oct. 9, 1909. No. 8413.

The Turbine and Reciprocating Engine a Combination for Better All-Around Efficiency in Vessels of War. H. C. Dinger. Suggests a combined arrangement and presents the advantages and disadvantages. 3500 w. *Jour Am Soc of Nav Engrs*—Nov., 1908. No. 1890 H.

Progress of Warships and Machinery Under Construction in England. A review of progress made during the last six months. 2200 w. *Engr, Lond*—Dec. 25, 1908. No. 1543 A.

Comparative Strength of the Navies of the World. An estimate based upon the battleship and cruiser strength. 1700 w. *Sci Am*—Feb. 20, 1909. No. 2527.

Types of Warships Omitted in Recent Programmes of Naval Construction. Lord Brassey. Read before the Inst. of Naval Archts. A brief discussion of the construction of battleships. 1500 w. *Engng*—April 2, 1909. No. 3906 A.

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Battleships

Fire Control Towers for Battleships. Charles B. Brewer. Illustrated description of fire control towers to be fitted to battleships of the United States Navy. 1000 w. *Am Mach*—Vol. 32. No. 16. No. 4106.

Requisites of the Battleship Best Adapted to the Italian Navy and Consideration of Its Tactical Employment. Romeo Bernotti. Examines the desirable and possible requisites, describing the type of battleship and studying its employment. Ills. 2800 w. *Pro U S Naval Inst*—March, 1909. No. 3549 F.

Modern Armored Ships (Les Cuirassés Modernes). A. Croneau. The first part discusses the evolution of the armored vessel, with especial reference to offensive power. Ills. Serial, 1st part. 6300 w. *Rev Gen d Sci*—Oct. 15, 1908. No. 523 D.

Battleships (Navi da Battaglia). E. Ferretti. An examination into the conditions of their maximum efficiency in action, discussing armor, armament, speed and ability to manoeuvre. 10000 w. *Riv Marit*—July-Aug., 1909. No. 7236 E + F.

The New United States Battleship "Mississippi." Illustrations, with brief description. 800 w. *Sci Am*—May 29, 1909. No. 5025.

U. S. S. "Michigan." William Ashley Leavitt, Jr. Illustration with description and report of official trials. 11800 w. *Jour Am Soc of Nav Engrs*—Aug., 1909. No. 8095 H.

The Launch of H. M. S. "Vanguard." Illustrations and information concerning this vessel, the seventh battleship of the Dreadnought class. 2500 w. *Engng*—Feb. 26, 1909. No. 3069 A.

The French Dreadnoughts. Illustrates and describes particulars of the constructive details, with critical remarks. 1500 w. *Engr, Lond*—April 30, 1909. No. 4627 A.

The French Battleships "Diderot" and "Condorcet." Illustrates and describes ships of the Danton class. 2000 w. *Int Marine Engng*—Oct., 1909. No. 8322 C.

The Speed Trials of the Deutschland Class. Brief comparison of types and designs, especially of the German vessels. 800 w. *Engr, Lond*—April 23, 1909. No. 4465 A.

The Russian Cruiser-Battleship "Rurik." Benjamin Taylor. Illustrated description of the vessel and its equipment, with report of trials. 1200 w. *Int Marine Engng*—Nov., 1908. No. 7 C.

The Brazilian Battleship "Sao Paulo." Illustrated detailed description. Plate. 1700 w. *Engng*—April 23, 1909. No. 4462 A.

British Navy.

The Future of the British Fleet in Its Relation to the Two-Power Standard. Archibald S. Hurd. An explanation of the "Two-Power Standard," and its development. Ills. 5000 w. *Cassier's Mag*—Nov., 1908. (Special No.) No. 387 D.

The Two Power Standard for the Navy. Sir William H. White. An examination of the reasons advanced for the new shipbuilding programme in England, explaining the present naval situation. 8500 w. *Nineteenth Century*—Dec., 1908. No. 1267 D.

The Future of Naval Engineering. Editorial discussion of the present situation in the British navy, with the statement of the case as prepared for circulation to Members of Parliament. 4000 w. *Engng*—March 12, 1909. No. 3419 A.

The Navy Estimates. A review of the proposals, with editorial review of the debate in Parliament. 6000 w. *Engng*—March 19, 1909. No. 3617 A.

The Naval Power of Great Britain and Supremacy on the Sea (Les Forces navales de la Grande-Bretagne et la Suprematie des Mers). E. Lignorelles. A comparison of the strength of naval powers. Ills. 3000 w. *Génie Civil*—May 1, 1909. No. 5731 D.

The Single Corps of Engineers (Il Corpo Unico). A Levi-Bianchini. A discussion from the Italian standpoint, of the abolition of the "naval engineers" in the British navy. 28000 w. *Riv Marit*—July-Aug., 1909. No. 7235 E + F.

Bulkheads.

Notes on the Strength of Steel Watertight Bulkheads. Athole J. Murray. Considers the problem of finding the necessary size, character and end fixing of the stiffeners. Plates. 3300 w. *Trans N-E Coast Inst of Engrs & Shipbldrs*—May, 1909. No. 5607 N.

Cable Steamers.

The Telegraph Ship "Telconia." Illustrations, with short description, of a new cable-repairing vessel. 1000 w. *Elect'n, Lond*—July 16, 1909. No. 6670 A.

Capstans.

Capstan Rims (Ueber Spillkranzformen). E. Schmidt. A discussion of the most efficient shape. Ills. 2500 w. *Schiffbau*—May 26, 1909. No. 5773 D.

"Clermont."

Launch of the Reproduced "Clermont" of Robert Fulton. An illustrated account of the ceremonies and a descrip-

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tion of the vessel. 7000 w. Naut Gaz—July 22, 1909. No. 6652.

The "Clermont." Brief illustrated description of Robert Fulton's steamboat, built in 1807. 800 w. Int Marine Engng—Sept., 1909. No. 7608 C.

Fulton and the Clermont. W. P. Stephens. An illustrated review of Fulton's life and the building of the Clermont. 2800 w. Rudder—Sept., 1909. No. 7689 C.

The "Half Moon" and the "Clermont." E. A. Dixie. Illustrated descriptions of Henry Hudson's "Half Moon" and Fulton's "Clermont." Describing the engine and boiler of the "Clermont." 2000 w. Am Mach—Vol. 32. No. 37. No. 7768.

See also Steam Engines, under MARINE AND NAVAL ENGINEERING.

Colliers.

United States Fleet Colliers Vestal and Prometheus. Drawings and description. 700 w. Marine Rev—Sept., 1909. No. 7724.

Communication.

Transmission of Intelligence on Steam Vessels. H. A. Hornor. Considers only the present means of interior communication for the safe manipulation of the vessel and accommodation of passengers, officers and crew. Ills. 8000 w. Jour Fr Inst—June, 1909. No. 5805 D.

Compass Deviation.

Change in Deviation of the Compass Due to Change in Trim. Lloyd H. Chandler. An investigation of the effect of an abnormal trim. Mathematical. 2000 w. Pro U S Naval Inst—Dec., 1908. No. 1336 F.

Deviation of the Compass Aboard Steel Ships and its Avoidance and Correction. L. H. Chandler. A statement of the general mathematical principles involved with illustrations from the results obtained aboard the vessels of the U. S. battleship fleet. Plates and tables. 16500 w. Soc of Nav Archts and Marine Engrs, No. 6—Nov., 1908. No. 265 N.

Compasses.

Improvements in Ship's Compasses. Explains disturbances of the compass due to the use of so much iron in ships and other causes, and the efforts made to solve the problem. Also recording apparatus for showing the course of the ship. 2000 w. Sci Am Sup—Oct. 2, 1909. No. 8213.

Condensers.

Steam Condensing Plant for Cargo Steamers. D. B. Morison. Illustrates and

Derricks

describes recent improvements. 2500 w. Cassier's Mag—Nov., 1908. (Special No.) No. 401 D.

Cruisers.

The Oldest Iron Ship in the World. Henry Penton. An account of the U. S. Man-of-War Michigan, in service on the Great Lakes. 1200 w. Soc of Nav Archts and Marine Engrs, No. 1½—Nov., 1908. No. 287 N.

Trials of the U. S. Scout-Cruiser Chester. Charles P. Wetherbee. Reports trials of a cruiser fitted with Parsons turbines. Plates. 1000 w. Soc of Nav Archts & Marine Engrs, No. 10—Nov., 1908. No. 271 N.

U. S. Scout-Cruiser Birmingham. Theo. C. Fenton. Illustrations, with description of machinery and report of official trials. 3500 w. Jour Am Soc of Nav Engrs—Aug., 1908. No. 660 H.

Description and Official Trials of the U. S. S. Salem. C. B. Edwards. Ills. 3000 w. Jour Am Soc of Nav Engrs—Nov., 1908. No. 1892 H.

Official Report of Coal Consumption Tests of the New Scout Cruisers. Memoranda of coal consumption on the "Birmingham," "Chester" and "Salem." 800 w. Power—June 8, 1909. No. 5324.

U. S. Armored Cruiser North Carolina. Theo. C. Fenton. Illustrations, with description of machinery and official trials. 4500 w. Jour Am Soc of Nav Engrs—Aug., 1908. No. 657 H.

U. S. Armored Cruiser Montana. William Russell White. Illustration, with description of machinery and report of the official trial. 14500 w. Jour Am Soc of Nav Engrs—Nov., 1908. No. 1889 H.

The French Armoured Cruiser. Ernest Renan. J. G. Peltier. Illustrated description with report of trials. 1500 w. Int Marine Engng—April, 1909. No. 3686 C.

The French Armored Cruiser Ernest Renan. Illustrated detailed description of the largest vessel of her type in the French navy. 3000 w. Engr, Lond—Sept. 3, 1909. No. 7757 A.

The Siamese Revenue Cruiser. Illustrated description of a vessel to be used for the suppression of the practice of opium and fire-arms smuggling in Siam. 700 w. Engng—Jan. 15, 1909. No. 2077 A.

Derricks.

Mast and Derrick Mountings. Illustrated descriptions. 1000 w. Int Marine Engng—July, 1909. No. 6076 C.

MARINE AND NAVAL ENGINEERING

Destroyers

Destroyers.

The Evolution of Speed in Torpedo Boat Destroyers. Fred A. Talbot. An illustrated review of development as shown in the Thornycroft vessels. 2500 w. *Marine Rev*—April, 1909. No. 3926.

The New British Destroyers. A critical discussion of the methods of the British Admiralty. 2500 w. *Cassier's Mag*—July, 1909. No. 6348 B.

The Torpedo-Boat Destroyer "Mothawk." E. Ommelange. Illustrated description of this turbine-driven destroyer of the British Navy. 1500 w. *Int Marine Engng*—April, 1909. No. 3684 C.

Torpedo-Boat-Destroyers for the Brazilian Navy. Plate and illustrated detailed description of these vessels. 2500 w. *Engng*—March 12, 1909. No. 3418 A.

Brazilian Torpedo-Boat Destroyers. Illustrated description of these vessels and their equipment. 3500 w. *Engr, Lond*—July 2, 1909. No. 6309 A.

Dockships.

German Naval Dockship Vulkan. Brief illustrated description of a vessel for docking and salving submarines. 400 w. *Engr, Lond*—Oct. 30, 1908. No. 199 A.

Dockyard Administration.

Dockyard Administration. A survey of the present administrative organization of the Royal Dockyards. 2500 w. *Engr, Lond*—Feb. 19, 1909. No. 2899 A.

Dredges.

Sea-Going Suction Dredges. Thomas M. Cornbrooks. Describes dredges for the Engineer's Department of the U. S. Army. Plates. 500 w. *Soc of Nav Archts & Marine Engrs.*, No. 15—Nov., 1908. No. 269 N.

A Combination Dipper and Clam-Shell Bucket Dredge. Frank Eder. Illustrated description. 1200 w. *Int Marine Engng*—Aug., 1909. No. 7119 C.

Design of Hulls for Hydraulic Cutter Dredges. E. N. Percy. Considers the requirements of a dredge hull. 1700 w. *Int Marine Engng*—May, 1909. No. 4492 C.

The Bates Electrically Driven Hydraulic Dredger. Illustrated description of a dredge constructed for the Russian government. 600 w. *Int Marine Engng*—May, 1909. No. 4491 C.

Simons' Clay-Cutting Reclamation Dredges. Illustrates and describes powerful dredgers used in the Port of Bombay, with report of their work. 1500 w. *Engng*—Sept. 3, 1909. No. 7749 A.

Education

A Modern Oyster Dredge. Francis K. Wilson, Jr. Remarks on oyster culture, with illustrated description of a dredge known as the "J. Van Wyne." 2000 w. *Eng News*—July 29, 1909. No. 6770.

The Dredger Leviathan. Drawings and particulars of the largest dredger in the world. 2200 w. *Engr, Lond*—April 2, 1909. No. 3913 A.

The 10,000-Ton Suction Dredger "Leviathan" for Use on the Mersey. Illustrated description of the most powerful dredges yet placed in operation. 1700 w. *Sci Am*—Nov. 6, 1909. No. 9079.

The Hopper and Suction Dredge "Venezia." Illustration and description of a seagoing dredge constructed for the Italian Government. 1000 w. *Engng*—Aug. 13, 1909. No. 7327 A.

Recent Dredge Construction (Neuere Baggerkonstruktionen). Herrn Paulmann and Blaum. Describes recent dredges for deep-water work. Ills. Serial, 1st part. 4500 w. *Zeitschr d Ver Deutscher Ing*—June 19, 1909. No. 6727 D.

Electrically Operated Dredges (Elektrisch betriebene Bagger). R. Richter. Describes in detail several electric dredges. Ills., Serial, 1st part. 3300 w. *Zeitschr d Ver Deutscher Ing*—June 12, 1909. No. 6725 D.

Bucket Dredges (Die Eimerkettenbagger). R. Richter. General discussion of their design. Ills., Serial, 1st part. 3200 w. *Zeitschr d Ver Deutscher Ing*—Oct. 24, 1908. No. 603 D.

Handling Dredged Material by Suction and by Pressure (Déchargeuses à Suction et à Refoulement pour les Déblais de Dragages). F. Hofer. Describes three types of dredges in use in harbors in Europe. Ills. 2000 w. *Génie Civil*—Sept. 4, 1909. No. 8627 D.

Dry Docks.

The Influence of Free Water Ballast upon Ships and Floating Docks. T. G. Roberts. A discussion of the stability and strength. Plates. 6000 w. *Soc of Nav Archts & Marine Engrs.*, No. 7—Nov., 1908. No. 266 N.

Education.

Naval Engineering Education in Great Britain. Sir William H. White. Address before the Royal Society of Arts. An account of the methods adopted for the education of naval architects in Great Britain during the past century. 10000 w. *Jour Soc of Arts*—Nov. 20, 1908. No. 725 A.

See also same title, under **INDUSTRIAL ECONOMY**.

MARINE AND NAVAL ENGINEERING

Electric Power

Electric Power.

The Electro-Mechanical Propulsion of Ships. A. P. Chalkley. Reviews some systems of electric propulsion tried or proposed. The design of Mr. Mayoe is especially considered. 2000 w. Elec Rev, Lond—July 23, 1909. Serial, 1st part. No. 6834 A.

Turbo-Electric Propulsion for Vessels. R. M. Neilson. Examines the advantages and disadvantages of the turbo-electric drive on shipboard. 2500 w. Cassier's Mag—Sept., 1909. No. 7778 B.

Electrical Propulsion of Ships. William P. Durnall. Abstract of a paper before the London Assn. of Foremen, Engineers, and Draughtsmen. Reviews the history of development in applying the electric motor to ship propulsion, showing the saving in fuel possible. 2500 w. Elec Engr, Lond—Sept. 10, 1909. No. 7856 A.

An Electrically Operated Rhine Boat (Elektrisch betriebenes Fährschiff für den Rhein). W. Kaemmerer. Describes a small vessel driven from accumulators. Ills. 1200 w. Zeitschr d Ver Deutscher Ing—May 15, 1909. No. 5962 D.

The Electrical Plant and Means of Interior Communication of a Modern Ocean-Going Passenger and Cargo Vessel. Charles J. Dougherty. Describes the plant installed on the new steamship "Momus." 8000 w. Marine Rev—Nov. 5, 1908. No. 151.

The Lighting and Power Arrangements and Other Uses of Electricity in a Modern Steamship. Louis P. Zimmerman. Illustrated description of the equipment of the "Minnesota," a combined passenger and freight-carrying vessel, 630 feet in length. 2500 w. Elec Rev, N Y—Dec. 19, 1908. No. 1061.

Electrical Installations for Transatlantic Liners. Albert H. Bridge. Gives illustrated particulars of the electrical installations on board the Mauretania. 4500 w. Elec Rev, N Y—June 12, 1909. No. 5479.

The Electrical Equipment of Liners and Battleships. A. P. Chalkley. Read before the Newcastle-on-Tyne Sec. of the Inst. of Elec. Engrs. Discusses the systems and applications made of electricity on shipboard. 5500 w. Elec Engr, Lond—March 19, 1909. No. 3601 A.

The Electrical Equipment of Liners and Battleships. A. P. Chalkley. Abstract of paper read before the Newcastle Sec. of the Inst. of Elec. Engrs. Discusses the reasons for the adoption of low-pressures for distribution on ships and describes typical arrangements of switchboards. Ills. 2500 w. Elect'n, Lond—March 25, 1909. No. 3779 A.

Ferryboats

Electrical Installations on Steamships. H. T. Boothroyd. Abstract of paper read before the Liverpool Engng. Soc. Deals with the wiring and details of the installation, the various uses of electricity and related subjects. 4500 w. Marine Rev—May, 1909. No. 4679.

Electrical Installations on Steamships. H. T. Boothroyd. Read before the Liverpool Engng. Soc. Explains the difficulties to be overcome and the special features, wiring practice, etc. 3500 w. Mech Wld—Aug. 20, 1909. Serial, 1st part. No. 7432 A.

Extended Uses of Electricity on Board Ship. John McLaren. Abstract of paper before the Inst. of Marine Engrs. Shows the great saving that can be affected by installing a suction-gas plant and alternator for supplying electrical energy for operating the auxiliaries. 9000 w. Elec Engr, Lond—Sept. 10, 1909. No. 7855 A.

Engineers.

The Engineer in the U. S. Navy. George W. Melville. Address at the Washington convention. Also presentation addresses by Walter M. McFarland and Dr. C. D. Walcott. 3300 w. Jour Am Soc of Mech Engrs—June, 1909. No. 5843 F.

Explosives.

The Propulsive Energy of Explosives. Sir Andrew Noble. Presented at joint meeting of Inst. of Engrs. & Shipbldrs., and the N-E Coast Engrs. Gives a sketch of the history of propellants, discussing the old gunpowders, and the modern propellants. 3000 w. Mech Engr—Sept. 10, 1909. No. 7853 A.

Ferryboats.

The Ferry. Miss Vandenberg, H. F. Bennett and L. E. Baldt. Plans and description of a double-end ferryboat propelled by internal combustion engines. For service on the St. Lawrence River. 1200 w. Int Marine Engng—Aug., 1909. No. 7120 C.

Steam Car Ferries on the Great Northwestern Lakes. Illustrated description of recent types. 3000 w. Naut Gaz—Feb. 25, 1909. No. 2865.

A Unique Ferryboat. Illustration, with brief description of an elevating vehicular ferry steamer for service in Glasgow harbor. 600 w. Int Marine Engng—Jan., 1909. No. 1598 C.

Unique Rhine River Electric Ferry Boat. Illustrated description. 800 w. Marine Rev—April, 1909. No. 3927.

MARINE AND NAVAL ENGINEERING

Ferryboats

International Steam Ferries. Information in regard to the new direct steam-ferry connection inaugurated between Sweden and Germany. 1500 w. Engng—July 9, 1909. No. 6426 A.

Ferry Boats for Kiel Harbor. Illustrated detailed description. 800 w. Int Marine Engng—April, 1909. No. 3685 C.

Danish State Railway Ferries. Harold M. Olsen. An outline of the construction and the services performed by this type of vessel. Ills. 4000 w. Inst of Engrs & Shipbldrs in Scotland—March 23, 1909. No. 3806 N.

The Car Ferries of the Danish Government. Axel Holm. Information in regard to the government ferry fleet, illustrating and describing some of the ferries. 2500 w. Int Marine Engng—April, 1909. No. 3681 C.

I. The Swedish State Railway Ferry Steamer "Malmö." II. Danish State Railway Steam Ferry "Christian IX." Illustrates and describes those two vessels as types of those used in the service between Sweden and Denmark. 1600 w. Engng—July 23, 1909. No. 6850 A.

See also Train Ferries, under RAILWAY ENGINEERING, MOTIVE POWER AND EQUIPMENT.

Ferry Steamers.

Train-Ferry Steamer "Fabius" for Northern Nigeria. Illustrated description of a 3-ft. 6-in. gauge railway train-ferry steamer. 1400 w. Engng—Oct. 1, 1909. No. 8490 A.

The Danish Railway Ferry "Prins Christian." Illustrated description of this large steel steamer and its equipment. 1500 w. Engng—Sept. 10, 1909. No. 7865 A.

Fire Boats.

Modern Fire-Boats. O. H. Caldwell. Illustrated description of the new electrically propelled and controlled fire-boats for the city of Chicago. 2000 w. Elec Rev, N Y—Jan. 2, 1909. No. 1468.

Centrifugal Pump Fire Boats. Charles C. West. Gives the result of a test made on the first of two 9,000-gallon boats just delivered to the city of Chicago. Plates. 1700 w. Soc of Nav Archts & Marine Engrs, No. 14—Nov., 1908. No. 273 N.

Fireboat W. A. McGonagle. Illustrated description of a vessel for the protection of Duluth harbor. 1500 w. Marine Rev—July, 1909. No. 6321.

Fishing Boats.

The East Coast Auxiliary Drifter "Sardius." Illustrated description of a

Gas Engines

fishing boat, fitted with a paraffin-motor. 1000 w. Engng—Aug. 20, 1909. No. 7443 A.

Floating Cranes.

Twin-Screw Floating Cranes. Illustrates and describes cranes recently built for the Argentine Government. 1500 w. Engng—Nov. 13, 1908. No. 445 A.

Description of a 140-Ton Floating Crane with a Test Capacity for Lifting 200 Tons. H. Prime Keffer. Illustrates and describes a new and interesting type built at Duisburg, Germany. 1400 w. Int Marine Engng—Dec., 1908. No. 750 C.

French Marine.

The Crisis in the French Marine. A discussion of the country's naval decline as revealed by the recent investigation of M. Picard. 3000 w. Engr, Lond—May 14, 1909. No. 4966 A.

French Navy.

The Report of the Commission of Inquiry on the French Navy (Il Rapporto della Commissione d'Inchiesta sulla Marina francese). Luigi Barberis. A discussion of the report from the Italian point of view 10000 w. Riv Marit—Sept., 1909. No. 8635 E + F.

Fuel Contracts.

The Choice and Control of Fuel Supplies by Steamship Companies. John B. C. Kershaw. Aims to show how the customary clause in steamship companies fuel contracts can be replaced by one affording greater protection. 2000 w. Engr, Lond—Aug. 20, 1909. No. 7483 A.

Fulton.

Fulton and His Life Work. An illustrated review. 3300 w. Sci Am—Sept. 25, 1909. No. 8076.

Robert Fulton's Contributions to the Success of Steam Navigation. Edward Hageman Hall. Extracts from a brief history of Henry Hudson and Robert Fulton published by the Hudson-Fulton Celebration Commission. 3000 w. Eng News—Sept. 16, 1909. No. 7898.

Gas Engines.

Gas vs. Steam for Marine Motive Power. A. B. Willits. Discusses the present standing of the suction-gas producer and gas engine, showing that until changes are made, it will be unavailable for high-power marine work. 12000 w. Pro U S Naval Inst—Dec., 1908. No. 1334 F.

Gas Power Aboard Ships. Henry Penton. A critical review of papers by Capt. A. B. Willits. 1800 w. Marine Rev—Feb. 4, 1909. No. 2313.

MARINE AND NAVAL ENGINEERING

Gas Engines

Marine Producer Gas Power. C. L. Straub. A comparison of producer-gas and steam equipments. Ills. 3500 w. Jour Am Soc of Mech Engrs—May, 1909. No. 4414 F.

Marine Producer Gas Power. Discussion of C. L. Straub's paper. 2000 w. Jour Am Soc of Mech Engrs—Sept., 1909. No. 8099 F.

The Gas Engine and Producer Plant and Its Adaptability for Marine Work. E. Shackleton. Considers the objections to such plants, and describes a gas plant of the suction type having four generators. 4000 w. Mech Engr—Dec. 25, 1908. No. 1507 A.

Adaptability of Producer Gas for Marine Work. E. Shackleton. Read before the Inst. of Marine Engrs. Outlines a scheme for large vessels from 4000 to 5000 tons gross. 2500 w. Int Marine Engng—Feb., 1909. No. 2264 C.

Gas-Driven Battleships and Cruisers. Reviews what has been done in applying producer-gas engines to the propulsion of warships, and the advantages of gas power. Ills. 1500 w. Sci Am—March 13, 1909. No. 3131.

Gas Engine and Equipment for the Non-Magnetic Yacht "Carnegie." Jas. Craig, Jr. Describes a special four-cylinder vertical engine with 11 x 12 cylinder containing less than 500 lbs. of iron or steel and made of non-magnetic materials. 1100 w. Rudder—June, 1909. No. 5333 C.

Gas Engine Experiments on H. M. S. Rattler. The Marquis of Graham. A report of recent trials. Ills. 1500 w. Cassier's Mag—Nov., 1908. (Special No.) No. 399 D.

A Successful Marine Producer-Gas Plant. Describes the plant installed on the motor boat "Marenging," and reports concerning its operation and economy. 1000 w. Int Marine Engng—Aug., 1909. No. 7121 C.

Dutch Marine Suction-Gas Plants. F. Muller Van Brakel. Illustrated description of an engine that can be managed by non-technical men; its construction is dealt with in the present article. 2000 w. Int Marine Engng—Oct., 1909. Serial. 1st part. No. 8325 C.

See also Motor Boats, under MARINE AND NAVAL ENGINEERING.

Gasoline Engines.

The Internal-Combustion Engines. W. G. Winterburn. A description of the gasoline engine as used for propelling small vessels. 2200 w. Marine Rev—Nov. 5, 1908. No. 153.

"Half Moon"

Marine Gasoline Engine Design. E. W. Roberts. Points out some special requirements for designing marine petrol engines according to modern ideas. Ills. 3500 w. Int Marine Engng—Nov., 1908. No. 6 C.

A New Reversing Motor for Launches and Yachts. G. O. M. Olsson. Explains the operation of a reversing internal combustion motor. Ills. 2000 w. Int Marine Engng—Feb., 1909. No. 2263 C.

Four-Stroke Marine Engines and Their Cylinders. A. H. Ziegler. Discusses the design of marine gasoline engines. 4500 w. Rudder—Oct., 1909. Serial. 1st part. No. 8457 C.

See Yachts and Life Boats, under MARINE AND NAVAL ENGINEERING.

German Navy.

The Naval Policy of Germany, Its Progress and Aims. Count Ernst von Reventlow. An illustrated review of the progress and aims of the German sea power. 6000 w. Cassier's Mag—Nov., 1908. (Special No.) No. 388 D.

Grain Elevators.

A Novel Cantilever Grain Elevator. Illustrated description of a novel design by Alfred H. Mitchell, and its operation in discharging grain from a ship's hold to other craft. It is of the self-propelling pontoon contained type. 2000 w. Sci Am—Sept. 11, 1909. No. 7630.

"Great Eastern."

The Great Eastern. Gives illustrated description and reviews the history of this large vessel. 2000 w. Int Marine Engng—Sept., 1909. No. 7617 C.

Guns.

Hydraulic or Electric Power for the Operation of Guns (Impianti di Artiglierie: Idraulici od Elettrici?). G. Pecori-Giraldi. A discussion of their relative advantages. Ills. 6800 w. Riv Marit—July-Aug., 1909. No. 7237 E + F.

"Half Moon."

The Half Moon. An illustrated article discussing the design of this vessel, and giving detailed description. 3500 w. Rudder—Sept., 1909. No. 7690 C.

The Half Moon. Brief illustrated description of the vessel which brought Henry Hudson into New York harbor three hundred years ago. 1200 w. Int Marine Engng—Sept., 1909. No. 7610 C.

Hendrick Hudson's Half Moon Reproduced. Illustrations and information concerning this vessel of the early part of

MARINE AND NAVAL ENGINEERING

Hospital Ships

the 17th century. 1200 w. *Naut Gaz*—Sept. 2, 1909. No. 7449.

Hospital Ships.

Boston Floating Hospital. Illustrated description of a vessel equipped with the indirect system of refrigeration and ventilation. 1200 w. *Ice & Refrig.*—March, 1909. No. 3022 C.

Hudson-Fulton

The Coming Hudson-Fulton Celebration. Warren O. Rogers. An illustrated article describing the "Half-Moon" and "Clermont" replicas now being built to participate in the great naval parade. 1500 w. *Power*—April 27, 1909. No. 4310.

See also "Clermont" and "Half Moon," under MARINE AND NAVAL ENGINEERING.

Hydroplanes.

The Hydroplane Ship. From *Shipping Gazette*. Brief account of early experiments and modern developments. 1500 w. *Marine Rev*—March 4, 1909. No. 3009.

"Hydroplanes" or "Skimmers." Sir John I. Thornycroft. Deals with boats which at high speeds are heavier than the water they displace. 2200 w. *Engng*—March 12, 1909. No. 3421 A.

Experiments With Hydroplanes or Skimmers. Illustrated account of results obtained by Sir John Thornycroft. 1500 w. *Sci Am*—June 12, 1909. No. 5397.

Hydroplane or Skimming-Boats. Brief account of the Thornycroft boat and results obtained with it. 1200 w. *Engng*—July 23, 1909. No. 6853 A.

"Tadpole"—Sir John Thornycroft's New Skimming Boat. Illustrates and describes a combination of boat and hydroplane which skims at 30 miles an hour. 2000 w. *Auto Jour*—July 24, 1909. No. 6829 A.

Hydroplanes or Skimmers. Sir John Thornycroft. Read before the Engng. Sec. of the British Assn. at Winnipeg. A report of the writer's experiments, illustrating models used. 2200 w. *Engng*—Sept. 3, 1909. No. 7751 A.

Skimming Boats. C. Johnstone. Illustrated review of recent developments in high-speed hydroplanes. 2000 w. *Cassier's Mag*—Aug., 1909. No. 7035 B.

Ice Breakers.

Canadian Ice-Breaking and Passenger Steamer. Illustration and description of the "Earl Grey" recently launched. 1200 w. *Engng*—June 18, 1909. No. 6044 A.

The Canadian Ice-Breaker "Earl Grey." Illustration with description. 800 w. *Engng*—Sept. 17, 1909. No. 8126 A.

International Competition

Ocean and River Ice (Les Glaces de Mer, Glaces de Rivières, Manœuvres de Préservation et de Déglaçage). M. Dibos. A discussion of glaciology in its relation to the problems of ocean and river navigation. Ills. 23000 w. *Mem Soc Ing Civ de France*—Nov., 1908. No. 2604 G.

A New Contribution on Methods of Preventing the Formation of Ice in Maritime and Inland Waterways (Nouvelle Contribution aux Etudes des Procédés de Déglaçages maritimes et fluviaux). M. Dibos. Describes ice breakers designed for use in Russian harbors. Ills. 2000 w. *Mem Soc Ing Civ de France*—May, 1909. No. 6504 G.

Internal-Combustion Engines.

Internal Combustion Engines for Marine Purposes. Sir John L. Thornycroft. An illustrated article showing the increasing use of gas power for propulsion. 2500 w. *Cassier's Mag*—Nov., 1908. (Special No.) No. 402 D.

The Propulsion of Ships by Internal-Combustion Engines. F. DeKeyser, in the *Ship Builder*. An illustrated review of what has been accomplished. 2500 w. *Marine Rev*—March 4, 1909. No. 3010.

The Application of Internal-Combustion Engines for Marine Propulsion. H. C. Anstey. Read before the Inst. of Naval Archts. Considers the advantages of fuel economy, weight and space. 3500 w. *Mech Engr*—April 2, 1909. No. 3902 A.

Large Internal-Combustion Engines for Land and Marine Purposes. Prof. W. H. Watkinson. Abstract of a paper read before the Liverpool Engng. Soc. A review of the development and applications, advantages, etc. 5000 w. *Mech Engr*—June 18, 1909. No. 6035 A.

Internal Combustion Engines for Submarines. F. R. S. Bircham. Read before Inst. of Naval Archts. Discusses the requirements and the advantages and disadvantages of methods generally adopted, and considers the Diesel cycle engines. Ills. 3300 w. *Mech Engr*—April 9, 1909. No. 4028 A.

Marine Motors at Olympia. An illustrated review of exhibits. 3000 w. *Engng*—March 26, 1909. No. 3789 A.

See also Gas Engines, Gasoline Engines, Motor Boats and Steam Turbines, under MARINE AND NAVAL ENGINEERING.

International Competition.

The Contest for Ocean Supremacy. Lawrence Perry. An account of preparations by German steamship companies to build faster ships than any now afloat,

Launching

and the probability of still faster British liners. Ills. 6000 w. *World's Work*—Nov., 1908. No. 28 C.

Launching.

Launching Calculations. John Smith. Read before the Inst. of Nav. Archts. On launching calculations with special reference to the effect of camber. 3500 w. *Engng*—Aug. 20, 1909. No. 7446 A.

Launching Measurements on the Lloyd Steamer "Berlin" at the Weser Company's Yards in Bremen, November 7, 1908 (Stapellaufmessungen beim Ablauf des Lloyd dampfers "Berlin" auf der Werft der Aktien-Gesellschaft "Weser" in Bremen am 7 November 1908). Otto Lienau. Results of tests to determine the speed of launching. Ills. 3200 w. *Schiffbau*—April 14, 1909. No. 4877 D.

Lifeboats.

New Motor Life Boat for Sandy Hook Life Saving Station. Illustrated description of the 6-cylinder gasoline engine life boat. 1400 w. *Naut Gaz*—April 15, 1909. No. 3983.

The Strength of Wooden Ship's Boats (Festigkeit hölzerner Schiffsbeiboote). J. Stieghorst. A discussion of their design for strength and safety. Ills. Serial. 1st part. 4000 w. *Schiffbau*—Feb. 10, 1909. No. 3374 D.

Life-Saving Appliances.

Novel Life-Saving Apparatus. A cylindrical cage built of rope ladders anchored by iron hoops, is illustrated and described. It is simple in design and operation and has been adopted by the German Admiralty. 700 w. *Sci Am*—Feb. 13, 1909. No. 2400.

Lightships.

Unwatched Flashing Gas-Lighted Boat. Illustrated description of a small lightship and its optical apparatus on trial on the English coasts. 1800 w. *Engr, Lond*—Aug. 27, 1909. No. 7661 A.

Marine Transport.

Recent Progress in Ocean Transportation and Ship Propulsion. Sir William H. White. Extracts from presidential address before the British Assn. for the Adv. of Science. 4000 w. *Eng News*—Sept. 23, 1909. No. 8018.

Britain's Place in the World's Shipping. Editorial review of information from a recent issue of Lloyd's Register, which shows that in respect to volume, and high-speed, and large capacity ships Britain holds the most prominent place. 1200 w. *Engng*—July 23, 1909. No. 6851 A.

Motor Boats

Fishguard and the Atlantic Service. Editorial on the service undertaken by the Cunard Line in connection with the Great Western Ry. 2000 w. *Engng*—Sept. 3, 1909. No. 7752 A.

Model Basins.

The Development and Present Status of the Experimental Model Towing Basin. Reviews the steps that led to the establishment of these tanks, and describes existing tanks and their operation. 2000 w. *Int Marine Engng*—Jan., 1909. No. 1600 C.

The Development and Present Status of the Experimental Model-Towing Basin. H. A. Everett. Illustrates and describes a number of these tanks. 2500 w. *Int Marine Engng*—Feb., 1909. Serial. 1st part. No. 2261 C.

The Value of the Model Experimental Basin in Ship Designing. Robert G. Skerrett. Considers the objects of a model basin and gives an illustrated description of the work at the testing tank of the Washington Navy Yard. 6000 w. *Cassier's Mag*—March, 1909. No. 2924 B.

The Management and Equipment of an Experimental Tank. Discusses the general arrangement of such tanks, their equipment, etc. 4500 w. *Engr, Lond*—July 16, 1909. Serial, 1st part. No. 6687 A.

Model Basins (Einiges über Schiffsmodell-Versuchsanstalten). A. Schromm. Brief notes on existing model basins, their cost, methods of investigation, etc. 2600 w. *Oest wochenschr f d Oeffent Baudienst*—July 10, 1909. No. 7456 D.

The Experimental Tank in Paris. Drawings and description of the plant and building containing it. 2000 w. *Engr, Lond*—April 2, 1909. No. 3910 A.

Report of the Experimental Tank Committee (1908). Read before the Inst. of Naval Archts. A report on the scheme for establishing an experimental tank at Bushy, in connection with the Nat. Phys. Laboratory. 4500 w. *Engng*—April 16, 1909. No. 4302 A.

Theory of the Wellenkamp Towing Method (Theorie des Schleppverfahrens nach Methode Wellenkamp). Herr Rothe. A comparison with the Froude method and an elaborate mathematical discussion. Ills. Serial. 1st part. 4200 w. *Schiffbau*—Feb. 24, 1909. No. 3376 D.

Motor Boats.

The Small Motor Boat. Harold Whiting Slauson. Deals with its care and operation. 2500 w. *Sci Am Sup*—July, 1909. No. 6624.

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Motor Boats

The Proper Installation of a Marine Motor. A. E. Palmer. Describes the general method of procedure. Ills. 2500 w. Naut Gaz—April 29, 1909. No. 4346.

Small Motor Boats. F. R. S. Bircham. Abstract of paper before the Inst. of Auto Engrs. Deals with features desirable in the design and installation of small marine internal combustion engines. 3000 w. Auto Jour—April 10, 1909. Serial. 1st part. No. 4024 A.

What the Automobile is Doing for the Boat Engine. Herbert S. Towle. A discussion of the comparative advantages of automobile and marine types. 2500 w. Rudder—May, 1909. No. 4592 C.

Power Boats and Power Boating in the Pacific Northwest. R. M. Haddock. Illustrated descriptions of types in use in a field especially suited to power boat usefulness. 3500 w. Rudder—May, 1909. No. 4590 C.

The British International Trophy Race of 1908. W. P. Stephens. Reviews earlier races of motor-boats, describes the boats entered, and gives report of the 1908 race. Plates. 6500 w. Soc of Nav Archts & Marine Engrs, No. 16—Nov., 1908. No. 274 N.

A Record Cross-Country Motor-Boat Trip. An illustrated account of a river trip from Pittsburg to Cincinnati. 2000 w. Sci Am—Aug. 21, 1909. No. 7147.

The Motor Boat Marenging. Illustrated description of a boat propelled by a producer gas plant, being built at St. Joseph, Mich. 2000 w. Int Marine Engng—March, 1909. No. 3015 C.

A Pressure Feed Fuel Supply System for Motor Boats. Carroll Le Roy Mosher. Explains the advantages and a simple method of installation. 2000 w. Naut Gaz—July 8, 1909. No. 6230.

See also Gas Engines, under MARINE AND NAVAL ENGINEERING; and Ignition, under MECHANICAL ENGINEERING, AUTOMOBILES.

Oil Economy

Practical Oil Economy of the U. S. S. Rhode Island. M. S. Holloway. Description of methods by which remarkable economy was secured in cruise around the world. Ills. 2100 w. Jour Am Soc of Nav Engrs—May, 1909. No. 5436 H.

Oil Engines.

The Application of the Diesel Motor to Marine Work (Application du Moteur Diesel à la Navigation). A. Bochet. A description of types and of results in service with a review of possible develop-

Paddle Boats

ments. Ills. 5200 w. Mem Soc Ing Civ de France—Nov., 1908. No. 2603 G.

The Diesel Motor for Marine Propulsion in Russia (Der Dieselmotor als Schiffsmaschine in Russland). Herr Murauer. Discusses advantages, describes installations and gives results. Ills. 5000 w. Schiffbau—July 28, 1909. No. 7286 D.

See also Ferryboats and Fishing Boats, under MARINE AND NAVAL ENGINEERING; and Oil Engines, under MECHANICAL ENGINEERING, COMBUSTION MOTORS.

Oil Fuel.

Oil Burning on Board Ship. Andrew Laing. An illustrated discussion of the importance and practicability of the use of liquid fuel. 3000 w. Cassier's Mag—Nov., 1908. (Special No.) No. 394 D.

Oil Fuel for Naval Use. H. C. Dinger. An illustrated description of the mechanical system of an oil installation, examining the advantages and disadvantages, and matters related to its economy and use. 7000 w. Jour Am Soc of Nav Engrs—Feb., 1909. No. 4059 H.

Oil vs. Coal as a Marine Fuel. G. P. Blackiston. Presents the advantages of oil over coal. Ills. 800 w. Jour Am Soc of Naval Engrs—Feb., 1909. No. 4056 H.

Oil vs. Coal as a Marine Fuel. G. P. Blackiston. Explains the conditions and the need of proper heating and burning appliances to make oil fuel successful, and claims decided advantages if properly used. Ills. 8000 w. Prac Engr—May 21, 1909. No. 5188 A.

See also Steamships, under MARINE AND NAVAL ENGINEERING.

Ordnance.

Naval Ordnance. A. Trevor Dawson. An illustrated study of modern naval artillery. 4500 w. Cassier's Mag—Nov., 1908. (Special No.) No. 397 D.

Ore Carriers.

Distribution of Cargo in Ore Carriers on the Lakes. Address of Robert Logan before the masters and officers of the Pittsburg Steamship Co., with discussion. Diagrams. 3000 w. Marine Rev—April, 1909. No. 3929.

Paddle Boats.

Pioneer Paddle-Boats in Britain. G. Pinhorn. Illustrates and describes early types, tracing the development. 2500 w. Int Marine Engng—Sept., 1909. No. 7611 C.

Porhydrometers

Porhydrometer.

The Porhydrometer. An account of tests made of this instrument for weighing the cargo of ships. Ills. 1000 w. Marine Rev—Oct., 1909. No. 8550.

Port Holes.

Round Port Holes (Runde Schiffs-Seitenfenster). Rudolf Sodemann. A discussion of materials, cost, and construction. Ills. 2800 w. Schiffbau—Dec. 9, 1908. No. 1962 D.

Progress.

Advances in Marine Engineering. James Denny. Abstract of presidential address at the Inst. of Marine Engineers. 4000 w. Mech Engr—Nov. 6, 1908. No. 307 A.

Propellers.

Origin of the Screw Propeller. Winfield M. Thompson. An account of the Stevens screw-propeller as used in 1804, describing the boat and giving related information. Ills. 8000 w. Rudder—May, 1909. No. 4589 C.

The First Steam Screw Propeller Boat. Abstract of an article by Francis B. Stevens in the *Stevens Indicator*. Describes the steam screw propellers of Col. John Stevens, in operation on the Hudson River from 1802 to 1806. 1500 w. Int Marine Engng—Sept., 1909. No. 7612 C.

Theory of the Screw Propeller. von J. W. Haussler. The mechanics of the design of the screw. 7000 w. Jour Am Soc of Nav Engrs—Aug., 1908. No. 658 H.

Propeller Computations. Charles S. Linch. Explains computations by Durand's method, and by Taylor's method, showing how closely they agree. 1000 w. Int Marine Engng—July, 1909. No. 6077 C.

Simple Method of Propeller Design. Charles S. Linch. Gives computations and describes methods of designing the blade. 1800 w. Int Marine Engng—July, 1909. No. 6075 C.

Further Propeller Analysis. Clinton H. Crane. Outlines the method used. Plates. 400 w. Soc of Nav Archts & Marine Engrs, No. 5—Nov., 1908. No. 270 N.

Recent Screw-Propeller Design. Notes the important investigations made of the efficiency of screw propellers, discussing features of design demanding attention to meet recent conditions. Ills. 2000 w. Int Marine Engng—Jan., 1909. No. 1596 C.

Comparative Tests on Screw Propellers. H. Lorenz. Trans. from *Zeit. des Ver. deutscher Ing.* Presents a new theory on the screw propeller, reporting tests and

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giving tables of experimental results. 2500 w. Jour Am Soc of Nav Engrs—Feb., 1909. No. 4054 H.

The Maximum Elementary Efficiencies as a Basis for the Construction of the Pitch of the Screw Propeller (Die maximalen elementaren Wirkungsgrade als Grundlage für die Konstruktion der Steigung der Schraubenpropeller). W. Helling. Ills. 3200 w. Schiffbau—May 12, 1909. No. 5771 D.

Ship Propulsion by Radial Reaction Propeller (Antrieb von Schiffen mittels radialen Reaktionspropellers). Herr Euler. Describes and discusses the system. Ills. 2500 w. Zeitschr f d Gesamte Turbinenwesen—Aug. 30, 1909. No. 7977 D.

The Flow of Fluids along Surfaces (Sur l'Ecoulement des Fluides de Long des Surfaces). A. Rateau. An outline of the author's propeller theory, which is applied to aeroplanes. Ills. 4500 w. Rev de Mécan—Aug., 1909. No. 7925 E + F.

Fluid Pressure on Inclined Planes. Editorial review of recent experiments by Prof. Rateau. 2000 w. Engng—Sept. 17, 1909. No. 8125 A.

Propeller-Testing Apparatus. Illustrates and describes the Westinghouse apparatus for testing screw propellers. 1000 w. Engng—July 2, 1909. No. 6307 A.

Screw Propeller Criticism and Notes on Screw Propeller Design Based on Actual Standardization Trial Results of U. S. Vessels. C. W. Dyson. 11500 w. Jour Am Soc of Nav Engrs—Feb., 1909. No. 4060 H.

Propulsion of Vessels by Contrary Turning Screws. G. Rota. Read before the Inst. of Naval Archts. Shows the possible increase in efficiency by the use of contrary turning screws on a common axis. Ills. 1800 w. Engng—April 9, 1909. No. 4035 A.

The Villinger Reversible Propeller. Illustrated description of a design that appears to be a practical success. 1200 w. Engng—Feb. 26, 1909. No. 3066 A.

The Determination of the Thrust of Propellers. J. H. Heck. Read before the Inst. of Naval Archts. Sketches and description of a mechanical method for determining the thrust. 3500 w. Engng—April 9, 1909. No. 4034 A.

See also Steam Engines, under MARINE AND NAVAL ENGINEERING.

Propulsion.

The Advance of Marine Engineering in the Early Twentieth Century. Arthur J. Maginnis. Reviews the rapid progress in the adoption of the steam turbine for

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Refrigeration

marine propulsion. Discusses the electric drive, liquid fuel, internal-combustion engines. 6000 w. *Inst of Mech Engrs*—July, 1909. No. 7090 N.

Refrigeration.

Sea Transport of Bananas Under Refrigeration. H. J. Ward. Illustrated description of steamers used in banana trade between West Indies and Great Britain and methods of loading. 2000 w. *Cold Stor & Ice*—Oct., 1909. No. 8572 C.

Repair Ship.

Description of the Foundry on the Vermont and Its Work. W. B. Tardy. A general description of the foundry installed and operated by the ship's force. 1000 w. *Jour Am Soc of Nav Engrs*—Aug., 1909. No. 8089 H.

The Naval Repair Ship "Cyclops." Illustrated description of a completely equipped floating factory. 4500 w. *Engng*—July 16, 1909. No. 6682 A.

H. M. S. Cyclops, Floating Repair Shop for the Navy. Illustrated detailed description of this floating workshop. Plates. 5600 w. *Engr, Lond*—July 23, 1909. No. 6856 A.

Resistance.

Further Experiments Upon Longitudinal Distribution of Displacement and Its Effect Upon Resistance. Herbert C. Sadler. Gives particulars of recent experiments in this field. Plates. 1400 w. *Soc of Nav Archts & Marine Engrs*, No. 4—Nov., 1908. No. 264 N.

The Influence of Midship-Section Shape Upon the Resistance of Ships. D. W. Taylor. Gives information obtained from experiments at the U. S. Model Basin during the past year. Plates. 2000 w. *Soc of Nav Archts & Marine Engrs*, No. 3—Nov., 1908. No. 263 N.

Review of 1908.

The World's Shipbuilding. A review of the year 1908. 2000 w. *Engng*—Jan. 15, 1908. No. 2076 A.

Shipbuilding and Marine Engineering in 1908. A review of the year's work in British shipyards. 10000 w. *Engng*—Jan. 1, 1909. No. 1710 A.

Scotch Shipbuilding in 1908. Benjamin Taylor. A review. 2500 w. *Int Marine Engng*—March, 1909. No. 3014 C.

Shipbuilding in 1908 (*Der Schiffbau im Jahre 1908*). F. Meyer and H. Dörwaldt. An exhaustive statistical review of shipbuilding operations all over the world. Serial. 1st part. 4500 w. *Schiffbau*—March 24, 1909. No. 4269 D.

Salvage Vessels

Rudders.

Clyde Rudders and Rudder Posts. Sketches and descriptions of general practice. 1800 w. *Int Marine Engng*—Nov., 1908. No. 5 C.

Safety Devices.

Safety of Travel on the Modern Ocean Liner. E. A. Stevens. An illustrated account of important safeguards to human life recently fitted to ships. 2500 w. *Am Rev of Revs*—March, 1909. No. 2918 C.

Sailing Vessels.

The American Sailing Ship. George L. Norton. Illustrates and describes interesting examples of sailing craft. 2000 w. *Int Marine Engng*—Jan., 1909. No. 1597 C.

The Development of the Sailing Ship. Sidney F. Walker. An illustrated historical review. 4500 w. *Int Marine Engng*—Sept., 1909. No. 7609 C.

Salvage.

Steel Lifting Lighters. Illustrations and brief description of large lighters for salvage purposes. 350 w. *Engng*—Aug. 20, 1909. No. 7445 A.

Raising Standard Oil Barge No. 91. Illustrated detailed description of the methods used to raise this vessel which sank just inside the Columbia River bar. 1500 w. *Marine Rev*—Aug., 1909. No. 7048.

The Salvage of the Steamer "Fleswick." Illustrates and describes in detail methods used in raising a steamer sunk in Cork harbor, by using compressed air, pumped into the holds after making them airtight. 2500 w. *Engng*—July 30, 1909. No. 6985 A.

A Novel Salvaging Operation. Illustrated account of the methods used to bring the "Netherton," injured by an explosion, from Singapore to England. 800 w. *Sci Am Sup*—Sept. 11, 1909. No. 7631.

Salvage Vessels.

An American Salvage and Repair Steamer. Illustrated description of the steamer "Favorite," in use on the Great Lakes. It is of steel construction and built for heavy weather. 1000 w. *Engr, Lond*—Feb. 5, 1909. No. 2492 A.

The French Submarine Salvage Boat Vulcain. Illustrated description of this specially designed vessel and its equipment. 500 w. *Engr, Lond*—June 11, 1909. No. 5633 A.

Shipbuilding

Shipbuilding.

Shipbuilding of Yesterday and To-day. George Leslie. Reviews the changes in material, design, and construction. 1500 w. Cassier's Mag—Aug., 1909. No. 7033 B.

America's Greatest Shipbuilding Establishment. Illustrated description of the plant of the Newport News Shipbuilding & Dry Dock Co. 2500 w. Naut Gaz—Nov. 12, 1908. No. 239.

Shipbuilding on the Great Lakes. Robert Curr. Describes a vessel of the hopper type being built on the mold system. Ills. 5000 w. Soc of Nav Archts & Marine Engrs, No. 12—Nov., 1908. No. 272 N.

Shipbuilding on the Great Lakes. Herbert C. Sadler. Read before the Inst. of Naval Archts. Explains the prevailing conditions, and describes features of the modern "Lake freighters." Ills. 3000 w. Engng—May 14, 1909. No. 4965 A.

The Works of Harland and Wolff, Limited, at Belfast. Illustrated description of these shipbuilding and engineering works, with illustrations of vessels built and their history. 16000 w. Engr, Lond—June 18, 1909. No. 6048 A.

Messrs. Yarrow's New Works on the Clyde. Illustrated detailed description of the Scotstoun works, Glasgow, and their equipment. 7500 w. Engng—Dec. 11, 1908. No. 1213 A.

German Shipyards. The first of a series of articles illustrating and describing the large private shipyards of Germany. 1200 w. Engr, Lond—Oct. 8, 1909. Serial. 1st part. No. 8942 A.

The New Vulcan Dockyard of the Stettin Company at Hamburg (Die neue Werft der Stettiner Maschinenbau-A.-G. Vulcan in Hamburg). Paul Ranft. Illustrated detailed description. Serial. 1st part. 3000 w. Zeitschr d Ver Deutscher Ing—Aug. 21, 1909. No. 8602 D.

The Shipbuilding and Engineering Company of Burmeister & Wain. Axel Holm. Illustrated description of this plant at Copenhagen, Denmark. 1500 w. Int Marine Engng—Nov., 1908. No. 2 C.

The Shipbuilding and Engineering Company of Akers Mekaniske Verksted, A. Gundersen. History and illustrated description of these shipbuilding works in Norway. 2500 w. Int Marine Engng—July, 1909. No. 6073 C.

A System of Control for a Shipyard. W. J. Wilson. An explanation of a system, followed by discussion. Plates. 2000 w. Trans N-E Coast Inst of Engrs & Shipbltrs—March, 1909. No. 3953 N.

Ship Design

Standardization. Archibald Denny. Read before the Inst. of Naval Archts. Report of work done by the Engineering Standards Committee on sections and tests for materials used in the construction of ships and their machinery. 7000 w. Engng—April 2, 1909. No. 3909 A.

Standardization. Archibald Denny. Read at meeting of the Inst. of Naval Archts. Report on the work done by the Engineering Standards Committee on sections and tests for materials and machinery. 5000 w. Marine Rev—May, 1909. No. 4680.

The Determination of the Dimensions of Building Ships (Die Bestimmung der Hellingabmessungen für den Fall kostspieliger Hellinganlagen). Albert Lincke. Gives tables of averages showing the most satisfactory and useful proportions. Ills. Serial, 1st part. 4000 w. Schiffbau—Nov. 11, 1908. No. 1164 D.

The Steel-Sections Problem in the German Shipbuilding Industry (Die Profilfrage im deutschen Handelsschiffbau). Carl Kielhorn. A discussion of possible improvements in the structural-steel sections available for shipbuilding purposes in Germany. Ills. Serial. 1st part. Schiffbau—Aug. 11, 1909. No. 7966 D.

The Scantlings of Steel Vessels. Gives Lloyds new rules for ships' scantlings, with explanatory statement, and editorial comment. 5000 w. Engng—June 25, 1909. No. 6281 A.

Shipbuilding Cranes (Hellingkrananlagen). W. Laas. The first part is devoted principally to examples in American shipyards. Ills. Serial, 1st part. 5000 w. Zeitschr d Ver Deutscher Ing—Oct. 10, 1908. No. 600 D.

See also Cableways and Cranes, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING; and Review of 1908, under MARINE AND NAVAL ENGINEERING.

Ship Cleaning.

The Electric Scrubber. Description of an electro-magnetic device for cleaning ships bottoms, whereby a "hogging brush" is held firmly to the plates. Ills. 1350 w. Elec Rev, Lond—May 28, 1909. No. 5419 A.

Ship Design.

Modern Ship Design. Leslie Denny. Read before the Manchester Assn. of Engrs. Explains how the first rough estimate for a ship is prepared, the design being more fully worked out in the drawing office. 2500 w. Mech Engr—March 5, 1909. No. 3155 A.

MARINE AND NAVAL ENGINEERING

Ship Design

A Note on Ship Geometry. Sir George Greenhill. Read before the Inst. of Naval Archts. Discusses geometrically the alteration in trim and draught due to loading and unloading, coaling and burning the coal, due to the movement of weight on board, and the change due to passage from fresh to salt water, or the reverse. 1500 w. Engng—April 16, 1909. No. 4303 A.

Notes on Naval Science Topics. Arthur R. Liddell. Explains a method of approximately determining the stability of vessels of full form. 2500 w. Int-Marine Engng—Nov., 1908. No. 4 C.

Fast Steamers Built on "Tetrahedral" Lines. Otto Kretschmer. Discusses the advantages of such a model. 900 w. Sci Am—Dec. 26, 1908. No. 1294.

Corrugated System of Ship Construction. Brief illustrated description of the "Monitoria," built on this system, which increases the longitudinal strength. 350 w. Sci Am—Oct. 2, 1909. No. 8211.

Relation of Size to Speed in Ships. Sidney G. Koon. Gives calculations made in connection with the design of a vessel for special requirements. 1000 w. Sci Am—Nov. 6, 1909. No. 9078.

Water-Tight Bulkheads in Passenger Vessels. A review of present practice in designing and locating bulkheads. 2500 w. Engr, Lond—Feb. 26, 1909. No. 3072 A.

Longitudinally Framed Ships. Illustrated detailed description of the "Craster Hall," a vessel built on the Isherwood system, with modifications. 5000 w. Engr, Lond—March 5, 1909. No. 3175 A.

Unsinkable and Uncapsizable Ships. Gen. E. E. Goulaeff. Read before the Inst. of Naval Archts. Illustrates and describes the Goulaeff form and system of construction. 5500 w. Sci Am Sup—Feb. 13, 1909. No. 2403.

Decrease in the Weight of Ships Through Change in the Regulations of the German Lloyd (Verminderung des Schiffsgewichts durch die Vorschriften des Germanischen Lloyd 1908). Fr. Jappe. Compares the old and new regulations with regard to the change in weight of certain parts of ships. Ills. 2500 w. Schiffbau—Dec. 9, 1908. No. 1961 D.

The New Freeboard Regulations of the German Marine Association and Modern Steamships (Die neuen Freibordvorschriften der See-Berufsgenossenschaft und die modernen Dampfertypen). Carl Kielhorn. Discusses the effect of the regulations on the cost and powering of ships. Ills. 6000 w. Schiffbau—Jan. 13, 1909. No. 2685 D.

Ship Repairing

German and English Merchant Vessels (Deutscher und englischer Handelsschiffbau). Carl Kielhorn. A comparison of German and English practice in ship design. Ills. Serial. 1st part. 4400 w. Schiffbau—March 10, 1909. No. 4268 D.

The Strength of Knees and Brackets on Beams and Stiffeners. Herman R. Hunt. An investigation of beams supported by knees at the ends. Tables and diagrams. 1500 w. Soc of Nav Archts & Marine Engrs, No. 7—June, 1909. No. 5681 N.

Some Experiments With Lightened Beam Brackets. R. Earle Anderson. Describes experiments made in connection with the design of torpedo-boat destroyers, stating results. Ills. 3000 w. Int Marine Engng—June, 1909. Serial. 1st part. No. 5213 C.

Keels of Minimum Resistance (Note intorno alle Carene di Minima resistenza). Luigi Faucher. Discusses their form and design. Ills. 6500 w. Riv Marit—March, 1909. No. 4238 E + F.

The Number of Shafts for Turbine Vessels. An investigation of the governing factors which decide the number of propelling shafts. 4500 w. Engng—Sept. 24, 1909. No. 8360 A.

The Shearing Strength of Riveter Seams in Shell Plating. R. E. Anderson. Explains shearing forces and methods of calculation. 3000 w. Int-Marine Engng—Nov., 1908. No. 3 C.

See also Bulkheads and Steamships, under MARINE AND NAVAL ENGINEERING.

Ship Heating.

The Heating of Modern Ocean Liners. W. Carlile Wallace. From a paper read before the Inst. of Naval Archts. Detailed discussion of systems used on a number of vessels, cost, etc. 3500 w. Int Marine Engng—Feb., 1909. No. 2259 C.

Piping Up a Merchant Vessel for Steam Heat. Allan Dale. Information based on experience. 3000 w. Int Marine Engng—Feb., 1909. No. 2260 C.

Ship Lighting.

See Ship Ventilation, under MARINE AND NAVAL ENGINEERING.

Ship Repairing.

The Repair and Maintenance of Ships. C. H. Hall and S. H. Bunnell. Illustrates and describes interesting emergency work in shipyards. 3000 w. Cassier's Mag—Nov., 1908. (Special No.) No. 390 D.

MARINE AND NAVAL ENGINEERING

Ship Resistance

Repairing the Crushed-in Bow of the Florida. Illustrations and brief account of the effect of the collision and the repairs made. 1000 w. Sci Am—Aug. 28, 1909. No. 7378.

Facilities for Repairing Ships in Italian Harbors (I Mezzi di Raddobbo per Navi esistenti nei Porti Italiani). Luigi Luigi. Illustrates and describes the docking facilities of the more important harbors. 3000 w. Ann d Soc d Ing e d Arch Ital—Nov. 1, 1908. No. 1129 F.

Ship Resistance.

The Resistance of Some Full Types of Vessels. Herbert C. Sadler. Gives results of experiments upon the resistance of vessels of full form. Diagrams. 1000 w. Soc of Nav Archts & Marine Engrs, No. 3—June, 1909. No. 5679 N.

A Note on the Determination of Ship Resistance (Etwas über die Bestimmung des Schiffswiderstandes). J. K. E. Triebart. Mathematical discussion. Ills. Serial. 1st part. 5500 w. Schiffbau—Sept. 8, 1909. No. 8669 D.

Researches on the Resistance of Boats to Towing, and a New Speed-Measuring Device (Recherches sur la Resistance à la Traction des Bateaux, un nouveau Mesureur de Vitesses). MM. Barlatier de Mas and Guillet. Illustrated description. 2000 w. Ann d Ponts et Chaussées—1909-I. No. 4812 E + F.

On the Resistance of Thin Plates and Models in a Current of Water. T. E. Stanton. Read before the Inst. of Nav. Archts. Gives results of experiments, describing apparatus used. Ills. 3000 w. Engng—April 16, 1909. No. 4300 A.

Ship Rolling.

The Dynamics of Rolling of a Ship. Sir G. Greenhill. An explanation of the mathematical theory of the motion of a ship, with remarks on the effect of design, storage of coal and cargo, etc. 2000 w. Engr, Lond—Dec. 11, 1908. No. 1219 A.

Ship Sanitation.

The Sanitation of Modern Passenger Ships. F. M. Williams. Discusses the Peninsular and Oriental Co., trading to the east, and the Cunard vessels in the Atlantic service and the successful arrangements. Also discussion. 3500 w. Jour Roy San Inst—Dec., 1908. Serial, 1st part. No. 999 A.

Ships' Bottoms.

Electric Scrubber for Cleaning Ships' Bottoms Without Dry Docking. Illustrated description. 900 w. Sci Am—Nov. 7, 1908. No. 105.

Ship Ventilation

Ship Specifications.

Ships' Specifications. J. R. Jack. Discusses briefly the technical qualities of a vessel and the requirements of a specification. 2500 w. Inst of Engrs & Shipbldrs in Scotland—March 23, 1909. No. 3805 N.

Ship Stability.

Stability and Comfort. Arthur R. Liddell. Discusses matters relating to stability of vessels. 2000 w. Engr, Lond—April 16, 1909. No. 4305 A.

A Simple Method for the Rapid Determination of the Transverse Stability of Ships (Ein einfaches Verfahren zur raschen Bestimmungen der Querstabilität eines Schiffes). Herr Ulfers. Ills. 2000 w. Schiffbau—Dec. 23, 1908. No. 1963 D.

Apparatus for Recording the Rolling and Pitching of Ships. Illustration and translated description from *Zeit. für Instrumentenkunde*. 900 w. Engng—Feb. 12, 1909. No. 2590 A.

The Stability of Steamships (Stabilité des Bateaux à Vapeur). M. Cornaz. A general discussion. 4500 w. Bul Tech d l Suisse Romande—Jan. 25, 1909. No. 2628 D.

Stability Tests of Ships at Sea (Festigkeitsversuche an Schiffen auf See). K. Beschoren. Describes methods and gives conclusions. Ills. 4500 w. Zeitschr d Ver Deutscher Ing—May 15, 1909. No. 5965 D.

A Short Method of Determining the Longitudinal Stability of Ships (Abgekürztes Verfahren zur Bestimmung der Längsfestigkeit von Schiffen). Alfred Schmidt. Mathematical demonstration. Ills. Serial. 1st part. 2800 w. Schiffbau—Aug. 11, 1909. No. 7968 D.

Ship Suction.

Some Model Experiments on Suction of Vessels. D. W. Taylor. An account of experiments made at the Model Basin during the year 1908. Diagrams. 1200 w. Soc of Nav Archts & Marine Engrs. No. 1—June, 1909. No. 5677 N.

Ship Testing.

Practical Methods of Conducting Trials of Vessels. Colonel E. A. Stevens. Brief explanation of the system in use in the U. S. Navy. Plates. 1500 w. Soc of Nav Archts & Marine Engrs, No. 2—Nov., 1908. No. 262 N.

Ship Ventilation.

Ventilating Plants on Shipboard (Note au Sujet des Installations de Ventilation à Bord des Navires). M. Boris. An exhaustive discussion of their design and in-

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stallation. Ills. Serial. 1st part. 8500 w. Rev de Méc—Jan., 1909. No. 2623 E + F.

Lighting and Ventilation of Inside Cabins (Ueber Beleuchtung und Ventilation von Innenkammern). R. Schmidt. Brief description of methods. Ills. 1300 w. Schiffbau—Feb. 10, 1909. No. 3375 D.

Ship Vibrations.

The Vibration of Ships. J. B. Henderson. Read before the Inst. of Naval Archts. Considers the elasticity of ships as deduced from experiments on the vibration of dynamical models. 4000 w. Engng—April 2, 1909. No. 3907 A.

Ship Vibrations (Schiffsschwingungen höherer Ordnung). W. Thele. Discusses their cause, etc. Ills. 3800 w. Zeitschr d Ver Deutscher Ing—Dec. 26, 1908. No. 2108 D.

Spanish Navy.

The New Spanish Navy. Editorial on the scheme laid out for the reinstatement of Spain among the naval powers of Europe. 2500 w. Engng—March 5, 1909. No. 3168 A.

Speed.

The Influence of the Depth of Water on Speed. A. F. Yarrow and W. W. Mariner. An illustrated article on the behavior of high-speed boats in shallow water. 2000 w. Cassier's Mag—Nov., 1908. (Special No.) No. 398 D.

Steamboats.

The Early History of Steam Navigation. An illustrated account taken from a work by Robertson Buchanan, published in 1816, describing early vessels propelled by steam, and by machinery driven by cattle. 2500 w. Engr, Lond—Oct. 8, 1909. No. 8941 A.

A Brief History of Early Steam Navigation in the United States. Reviews the work of Fulton, Stevens, and Fitch. Ills. 1800 w. Jour Am Soc of Mech Engrs—Oct., 1909. No. 8529 F.

American Steamboats Prior to the "Clermont." Brief illustrated descriptions of boats of Rumsey, Fitch, and Stevens, with a summary of other efforts. 3000 w. Sci Am—Sept. 25, 1909. No. 8078.

European Steamboats Prior to the "Clermont." Illustrated review. 1600 w. Sci Am—Sept. 25, 1909. No. 8079.

Jonathan Hulls and His Steamboat. Edward P. Buffet. Sketch of the inventor and description of one of the earliest patented systems of vessel propulsion by means of the steam engine. Ills. 2500 w. Power—May 4, 1909. No. 4487.

Steam Boilers

Development of the Hudson River Steamboat. A review of the development, illustrating types of vessels and giving interesting information. 3500 w. Sci Am—Sept. 25, 1909. No. 8077.

Shallow-Draught River Steamers. C. E. Ward. Discusses in detail the peculiar character of river steamers, the hull, machinery and its performance, etc. Ills. 9600 w. Soc of Nav Archts & Marine Engrs, No. 4—June, 1909. No. 5810 N.

The Development of Western River Steamboats. T. M. Rees. Illustrations and descriptions of typical boats used since 1811. 2000 w. Int Marine Engng—Sept., 1909. No. 7613 C.

Launch of Magnificent New Hudson River Steamboat, Robert Fulton. Illustration, with interesting details of a vessel built in record time. 1200 w. Naut Gaz—March 25, 1909. No. 3503.

The "Robert Fulton." A Record in River Steamboat Construction. Illustrated description of this vessel which was launched in two months and ten days after the keel was laid. 1500 w. Sci Am Sup—April 10, 1909. No. 3840.

New Hudson River Steamboat, Robert Fulton. Illustrated detailed description of this fine new river passenger steamer, which was built in record time. 6000 w. Naut Gaz—June 17, 1909. No. 5609.

United States Life-Saving Steamer, "Snohomish." Illustrated description of a vessel designed and equipped for life-saving under difficult conditions. 1300 w. Sci Am—March 6, 1909. No. 2969.

New Passenger Steamer Hyak. H. Cole Estep. Brief illustrated description of a vessel for service on Puget Sound. 1500 w. Marine Rev—June, 1909. No. 5499.

Shallow Draught Steamers for the Amazon. Illustrations and particulars of five vessels built to meet special conditions. 500 w. Engr, Lond—May 21, 1909. No. 5202 A.

See also Paddle Boats, under MARINE AND NAVAL ENGINEERING.

Steam Boilers.

Gunboat Boilers. Charles S. Linch. Illustrates and describes the low high-pressure boilers in the Wilson Line boats on the Delaware River. 2000 w. Int Marine Engng—March, 1909. No. 3012 C.

Gunboat Boilers. Charles S. Linch. Illustrated description of boilers installed on the Wilson Line steamboats. 1800 w. Boiler Maker—Nov., 1908. No. 12.

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Steam Boilers

Naval Boilers in Service. H. C. Dinger. A review of the relative advantages developed, repairs now necessary, and general economy of the various types of boilers on the vessels of the U. S. fleet that encircled the globe. Ills. 3300 w. Int Marine Engng—May, 1909. No. 4495 C.

Replacing the Furnaces of Marine Boilers Under Unusual Difficulties. William Shoemaker. Prize paper. Illustrated description of work on a steamship in service on the Great Lakes. 700 w. Boiler Maker—June, 1909. No. 5456.

The Treatment of Marine Boilers. H. Ruck-Keene. Read before the Inst. of Marine Engrs. Discusses some of the causes of boiler failures and the treatment that will remedy the troubles. 4000 w. Mech Engr—Sept. 17, 1909. Serial. 1st part. No. 8120 A.

The Development of the Marine Boiler (Ueber die Entwicklung der Schiffskessel). F. Romberg. A general review of recent progress. 2500 w. Schiffbau—Oct. 28, 1908. No. 563 D.

Steam Engines.

The Development of the Modern Marine Engine. J. W. Reed. Illustrated description of the latest practice in the powering of steamships. 7500 w. Cassier's Mag—Nov., 1908. (Special No.) No. 393 D.

The Reciprocating Engine in Marine Practice and Its Probable Future. D. Gibson. Reviews the types of marine reciprocating engines now in use, and notes the considerations that determine the adoption of each type. Ills. 5000 w. Jour Am Soc of Nav Engrs—Feb., 1909. No. 4057 H.

The Reciprocating Marine Engine. Abstract of a paper by D. Gibson, before the Manchester Assn. of Engrs. Discusses its present and future standing. 1800 w. Engr, Lond—Dec. 18, 1908. No. 1375 A.

The Efficiency of Marine Engines and Propellers. J. Hamilton Gibson. Suggestions bearing on the problem of mechanical efficiency of marine engines. 2000 w. Engr, Lond—Jan. 29, 1909. No. 2368 A.

The Mechanical Efficiency of Marine Engines. Refers to paper by J. Hamilton Gibson on "Torsion Meters in Marine Work," and discusses the determination of torque in shafting. Ills. 2000 w. Engr, Lond—Nov. 13, 1908. No. 450 A.

Piston Engines versus Turbines on the Atlantic. R. Caird. A comparative study of engine and turbine efficiency. 1500 w. Cassier's Mag—Nov., 1908. (Special No.) No. 396 D.

Steam Engines

The Turbine and Reciprocating Engine for Naval Purposes. W. G. Diman. Examines the claims of the turbine and concludes that it has not yet shown enough advantage to warrant its taking the place of the reciprocating engine. 3000 w. Jour Am Soc of Nav Engrs—Feb., 1909. No. 4055 H.

The Comparative Weights of Reciprocating and Turbine Machinery for Marine Work. N. W. Greenway. Gives tabulated data showing the increased h. p. per ton of machinery weight in various classes of vessels, with discussion of the subject. 1000 w. Engrg—Aug. 13, 1909. No. 7329 A.

The Combination of Reciprocating and Turbine Engines. W. McK. Wisnom. Read at joint meeting in Glasgow. Notes on the trials and performance of the S.S. "Otaki," fitted with a combination of reciprocating and turbine machinery. Ills. 4500 w. Engrg—Aug. 6, 1909. No. 7106 A.

A Practical Comparison of the Advantages of Higher Cylinder Ratios. C. S. Root. An account of two moderately long runs of the same vessel with different cylinder ratios. 2000 w. Int Marine Engng—July, 1909. No. 6079 C.

The Marine Steam Engine Indicator. Charles S. Root. Aims to present the best features of standard literature, and to give a résumé of present practice. Ills. 2500 w. Int Marine Engng—July, 1909. Serial. 1st part. No. 6078 C.

Steam-Engine Pipe Arrangements. E. Herbert. A large marine engine is taken as an example to illustrate the arrangement of pipes, valves, connections, etc. 1200 w. Mech Wld—Aug. 13, 1909. No. 7321 A.

Emergency Repairs at Sea. P. J. Giron. Illustrates and describes examples taken from actual experience. 800 w. Prac Engr—Dec. 25, 1908. Serial. 1st part. No. 1514 A.

Marine Engine Repairs Under Way. E. C. Kalbfus. Describes repairs made to an engine of the *Kansas*, while with the fleet on its journey around the world. Ills. 2000 w. Pro U S Nav Inst—Sept., 1909. No. 8056 F.

James P. Allaire and the Allaire Works. Edward P. Buffet. Gives facts concerning an early steam engine industry and its founder. 2500 w. Power—Dec. 8, 1908. No. 878.

The Engine of Fulton's Clermont. Gives model of the engine and history relating to it. 1000 w. Ir Age—Sept. 23, 1909. No. 8000.

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The American Walking-Beam Engine. Illustrated description of the engine that has been the favorite for Hudson River steamboats. 2000 w. Sci Am—Sept. 25, 1909. No. 8080.

The Propelling Engines of H. M. Cruiser "Defence." Plate and description. 1000 w. Engng—Dec. 18, 1908. No. 1374 A.

Engines of the Steamship Graceful. Plate and illustrated description of engines for a quarter-deck type steel vessel designed for the coasting trade. The feature of particular interest is the condenser. 800 w. Engr, Lond—Oct. 1, 1909. No. 8497 A.

Machinery of the Italian Battleship Napoli. Illustrated description of the propelling machinery of this recently completed vessel. Plate. 1000 w. Engr, Lond—Aug. 20, 1909. No. 7484 A.

See also Engine Lubrication, Ore Carriers and Steam Turbines, under MARINE AND NAVAL ENGINEERING; Torsionmeters, under MECHANICAL ENGINEERING, MEASUREMENT; Valve Gears, under MECHANICAL ENGINEERING, STEAM ENGINEERING; and Locomotives, under RAILWAY ENGINEERING, MOTIVE POWER AND EQUIPMENT.

Steam Engineering.

Steamship Engineering Economies. Discusses possible economies in marine practice. 2000 w. Int Marine Engng—Dec., 1908. No. 751 C.

Steaming Competition.

Naval Engineering Competition. H. C. Dinger. Concerning the system of engineering competition established in the U. S. Navy and the good results expected from the contests. 4000 w. Jour Am Soc of Nav Engrs—Aug., 1909. No. 8091 H.

Steamships.

The Design of Fast Ocean Steamers. E. W. De Rusett. An illustrated review of the progress and development. 5000 w. Cassier's Mag—Nov., 1908. (Special No.) No. 391 D.

The Design and Building of Modern Cargo Steamers. S. J. P. Thearle. States the requirements of such vessels, and describes methods of British shipbuilders, illustrating vessels in different stages of construction. 4000 w. Cassier's Mag—Nov., 1908. (Special No.) No. 386 D.

Some Recent Inventions as Applied to Modern Steamships. W. Carlile Wallace. Remarks on recent inventions that tend to increase safety and comfort of passengers. Plates. 5000 w. Soc of Nav

Steamships

Archts & Marine Engrs, No. 8—Nov., 1908. No. 267 N.

The First Year's Operation of the "Kronprinzessin Cecilie," the "Lusitania" and the "Mauretania." (Die Schnell-dampfer "Kronprinzessin Cecilie," "Lusitania" and "Mauretania" im ersten Betriebsjahre). S. Bock. A comparison of service results. 5200 w. Schiffbau—Oct. 14, 1908. No. 562 D.

Development of the Transatlantic Steamship. Reviews the growth since 1840. Ills. 1600 w. Sci Am—June 19, 1909. No. 5583.

A New Type of Great Lake Ore Steamer. Day Allen Willey. Illustrated description of the "Hoover and Mason" as a type. 1500 w. Sci Am Sup—June 19, 1909. No. 5584.

The Great Ore Carriers on the Great Lakes. James Cooke Mills. Illustrates and describes special methods of construction used. 2500 w. Cassier's Mag—Nov., 1908. (Special No.) No. 392 D.

Steam Collier or Ore Vessels Adapted for Belt Conveyor Discharge. Gives illustrated description of a new type of vessel in which the coal or ore is discharged by belt-conveyors. 1400 w. Ir & Coal Trds Rev—Jan. 29, 1909. No. 2373 A.

The Steam Collier "Pallion." Illustrated description of a collier equipped with twin-belt conveyors for discharging her cargo. 500 w. Engng—Aug. 27, 1909. No. 7656 A.

A New Swedish Ore Vessel. Illustrated description of the Vollrath Thans, which carries its own unloading plant. 1000 w. Ir Age—Oct. 7, 1909. No. 8374.

The Steamer Commonwealth. Warren T. Berry and J. Howland Gardner. Illustrations, drawings and description of a vessel for night service between New York and Fall River. 3000 w. Soc of Nav Archts & Marine Engrs, No. 13—Nov., 1908. No. 286 N.

Service Test of the Steamship Harvard. C. H. Peabody, W. S. Leland and H. A. Everett. Plates. 1500 w. Soc of Nav Archts & Marine Engrs, No. 9—Nov., 1908. No. 268 N.

The New Mallory Line Steamship Brazos. Illustrated detailed description of a fine steamship for service between New York and Galveston, Texas, and its performance. 5000 w. Naut Gaz—Nov. 12, 1908. No. 238.

The Mallory Line Steamship Brazos. Sidney Graves Koon. Illustrated detailed description of this new steel twin-screw

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steamer. 3500 w. Int Marine Engng—Dec., 1908. No. 749 C.

Some Features of the Propelling Machinery and Result of Performance of the New Mallory Line Steamship Brazos. 3000 w. Naut Gaz—Dec. 10, 1908. No. 914.

Freighters for the A. H. Bull Steamship Company. Illustrated detailed description of a steel freight steamship for foreign trade. 1200 w. Marine Rev—May, 1909. No. 4678.

Steel Passenger Steamer. H. B. Kennedy. Illustrated description of a vessel for fast daylight service on Puget Sound. 2000 w. Marine Rev—April, 1909. No. 3928.

The Rathmore. Illustrated detailed description of a fine new passenger steamship in service of the London and North-western Railway between Holyhead and Greenore. 2 plates. 2000 w. Engr, Lond—Jan. 15, 1909. No. 2081 A.

The Turbine Steamer "Ben-My-Chree." C. J. Blackburn. Read before the Inst. of Naval Archts. An account of practical experience with the Parsons marine steam turbine. Ills. 3000 w. Engng—April 9, 1909. No. 4036 A.

British Tank Steamers for the Pacific Trade. Describes vessels fitted to run under oil fuel, reporting trial. Ills. 600 w. Engr, Lond—Oct. 15, 1909. No. 8947 A.

A Longitudinally-Framed Ship. Benjamin Taylor. Illustrated description of the oil tank steamer Paul Paix, constructed on the Isherwood system. 1200 w. Int Marine Engng—Jan., 1909. No. 1599 C.

The Hamburg-American Line Steamer Cleveland. Illustrated description. 3500 w. Int Marine Engng—March, 1909. No. 3011 C.

The White Star Liner Megantic. Illustrated description. 600 w. Engr, Lond—Dec. 18, 1908. No. 1378 A.

Triple-Screw Steamer Laurentic. Brief illustrated description of a new vessel for the White Star Dominion service. 1000 w. Engr, Lond—April 23, 1909. No. 4470 A.

The Steamship "George Washington." Illustrated description of the latest type of passenger and freight-carrying steamship. 1000 w. Sci Am Sup—Dec. 19, 1908. No. 1232.

The Twin-Screw Passenger and Freight Steamship "George Washington" of the North German Lloyd (Der Doppelschrauben-Passagier- und Frachtdampfer "George Washington" des Norddeutschen Lloyd). Paul Driessen. Illustrated detailed de-

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scription. Plates. 20000 w. Schiffbau—Jan. 27, 1909. No. 2686 D.

The "George Washington." Illustrated description of this new North German Lloyd steamer. 1600 w. Sci Am Sup—June 26, 1909. No. 5897.

S. S. "George Washington." Illustrated description of this new first-class twin-screw passenger and freight steamship of the North German Lloyd. 1400 w. Int Marine Engng—July, 1909. No. 6080 C.

Norddeutscher-Lloyd Twin Screw Steamer "George Washington." Illustrated detailed description of this large vessel and its equipment. Plate. 4500 w. Engng—Aug. 27, 1909. No. 7654 A.

The Twin-Screw Steamer "George Washington" (Der Doppelschraubendampfer "George Washington"). Ernst Kurtzahn. Illustrated description, with plates. 3000 w. Zeitschr d Ver Deutscher Ing—Sept. 25, 1909. No. 8917 D.

The Latest Twin-Screw Passenger and Freight Steamer "George Washington" of the North German Lloyd (Der neueste Doppelschrauben-Passagier- und Frachtdampfer "George Washington" des Norddeutschen Lloyd, Bremen). A. Schromm. Illustrated description. Plates. Serial. 1st part. 4500 w. Oest Wochenschr f d Oeffent Baudienst—Sept. 18, 1909. No. 8693 D.

A Modern Floating Hotel. Julius Grundmann. Illustrated description of the North German Lloyd liner "Kronprincessin Cecilie." 2500 w. Cassier's Mag—Dec., 1908. No. 948 B.

The Twin-Screw Passenger and Freight Steamship "Prinz Friedrich Wilhelm" (Der Doppelschrauben-Personen- und Frachtdampfer "Prinz Friedrich Wilhelm"). Illustrated description of this new North German Lloyd liner. Serial. 1st part. 2300 w. Zeitschr d Ver Deutscher Ing—Jan. 2, 1909. No. 2834 D.

North German Lloyd Twin-Screw Passenger and Freight Steamer ("Berlin") (Der Doppelschrauben-Passagier- und Frachtdampfer "Berlin" des Norddeutschen Lloyd). Otto Lienau. A detailed description. Ills. 28000 w. Schiffbau—June 23, 1909. No. 6586 D.

The Italian Passenger and Emigrant Steamer "America." Illustrated description of a vessel designed for the River Plate service. Only first and third class passengers are carried. Plate. 1000 w. Engng—Sept. 24, 1909. No. 8361 A.

The Coal Steamer "John Heidmann" (Kohlendampfer "John Heidmann"). Illustrated description with detailed plates.

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1000 w. Schiffbau—July 14, 1909. No. 7285 D.

The Japanese Volunteer Turbine Steamer "Sakura Maru." Illustrated description. 1800 w. Engng—March 5, 1909. No. 3172 A.

The Triple-Screw, Turbine-driven Pacific Liner "Tenyo Maru." Illustrated detailed description of this first of these sister ships for the Oriental Steamship Co. of Japan. 7500 w. Plates. Engng—Oct. 30, 1908. No. 195 A.

The Turbine Steamship "Tenyo Maru" (Der Turbinendampfer "Tenyo Maru"). W. Kaemmerer. Illustrated description of this new vessel of the Japanese merchant marine. 3500 w. Zeitschr d Ver Deutscher Ing—Oct. 17, 1908. No. 602 D.

The Pacific Steam Navigation Company's Twin-Screw Steamer "Orcoma." Illustrations, deck plans and description of a vessel built for high economy in the merchant service. 900 w. Engng—Feb. 12, 1909. Serial. 1st part. No. 2592 A.

The Orient Company's Australian Mail Liner "Otway." Illustrations, with description of this new twin-screw vessel and its machinery. 3300 w. Engng—June 4, 1909. No. 5528 A.

The New Orient Liners. Describes large passenger steamship "Orsova" and other ships constructed for Orient Mail line for Australian service. Ills. 2500 w. Engr, Lond—May 28, 1909. No. 5316 A.

The New Orient Australian Mail Liner "Orsova." Illustrated description of the first of four vessels designed for service between Europe and Australia. "Orsova" is of 15,100 tons displacement and 18 knots speed. Plates. 5200 w. Engng—May 28, 1909. No. 5260 A.

The Orient Company's Twin-Screw Liners "Otranto" and "Orvieto." Illustrated detailed description of these Australian mail liners, recently completed. 3500 w. Engng—Oct. 29, 1909. No. 9183 A.

The Orient Company's Australian Mail Liner "Osterley." Plate and illustrated description of the mechanical equipment, with report of steam trials. 2000 w. Engng—June 25, 1909. No. 6283 A.

Twin Screw Steel Steamship Columbian. Brief illustrated description of a cargo carrier in the Pacific trade. 700 w. Marine Rev—June, 1909. No. 5498.

Fruit and Passenger Steamer "Tortugero." Illustrations and particulars of a recently built vessel for service between the West Indies and England, which possesses interesting systems of ventilation

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and refrigeration. 4000 w. Engr, Lond—July 9, 1909. No. 6428 A.

See also Destroyers, Ore Carriers, Shipbuilding, Steam Engines and Steamships, under MARINE AND NAVAL ENGINEERING.

Steam Turbines.

Recent Developments in the Marine Steam Turbine. R. J. Walker. A review of progress in turbine propulsion in merchant and naval vessels. Ills. 2500 w. Cassier's Mag—Nov., 1908. (Special No.) No. 400 D.

Some Remarks on the Steam Turbine. J. W. Powell. Explains the principles of the action and reaction of turbines, and gives a brief historical review of the development. Plates. 4200 w. Soc of Nav Archts & Marine Engrs, No. 11—Nov., 1908. No. 288 N.

Turbines or Motors in Ships. Trans. from *Nauticus*. Compares the advantages and disadvantages of steam turbines and internal combustion engines. 13500 w. Jour Roy U S Inst—March, 1909. No. 3802 N.

The Steam Turbine and the Reciprocating Engine for Marine Propulsion. Ira N. Hollis. This third article of a series gives a critical analysis of factors, results and tendencies. Ills. 2500 w. Engineering Magazine—July, 1909. No. 5978 B.

The Steam Turbine and the Reciprocating Engine for Marine Propulsion. Ira N. Hollis. Concluding article of a discussion with deductions. 2500 w. Engineering Magazine—Aug., 1909. No. 6750 B.

Modern Turbine Installations in War Vessels. G. Bauer. Illustrates and describes the turbine systems installed and considers points in the preparation; discussing steam consumption, etc. Also discussion by Director Boveri. 12800 w. Jour Am Soc of Nav Engrs—Aug., 1909. No. 8088 H.

Steam Turbines in the Navy. On the advantages of turbines, their manipulation and care. 2500 w. Mech Wld—Feb. 19, 1909. Serial. 1st part. No. 2886 A.

Marine Turbines (Les Turbines marines). A general article on their construction, installation and operation. Ills. 3000 w. Tech Mod—March, 1909. No. 4230 D.

The Present Development of the Marine Steam Turbine (Die heutige Entwicklung der Schiffsturbine). H. Schmidt. A general review. Serial, 1st part. 3000 w. Zeitschr f d Gesamte Turbinenwesen—April 30, 1909. No. 4882 D.

MARINE AND NAVAL ENGINEERING

Steam Turbines

The Prospects of the Various Systems of Steam Turbines for Marine Work (Ueber die Aussichten der verschiedenen Dampfturbinen-Systeme im Schiffsturbinenbau). H. Jansson. A comparative discussion. 1600 w. Die Turbine—June 20, 1909. No. 6583 D.

Cruising Turbines on War Ships Driven by Reaction Turbines (Le Turbine di Marcia a Bordo delle Navi da Guerra Mosse con Turbine a Reazione). G. Beluzzo. A brief mathematical note on their design. Ills. 2300 w. Industria—July 11, 1909. No. 7241 D.

Marine Steam Turbines. Discusses the application of turbines to merchant vessels, examining the advantages claimed, and showing the propeller to be the weak point in the turbine system. 4000 w. Engr, Lond—April 30, 1909. No. 4626 A.

The Manoeuvring Capabilities of Turbine-Driven Vessels. Shows how the turbine-driven vessel is manoeuvred in narrow tidal waterways. Diagram. 1800 w. Engng—April 23, 1909. No. 4460 A.

On the Adaptation of Steam Turbines for the Propulsion of Vessels at Moderate Speeds. Yasuzo Wadagaki. A study of this problem, with explanation of the system evolved by the author, discussing its advantages and disadvantages, and reporting experiments. Short discussion. Ills. 5000 w. Trans N-E Coast Inst of Engrs & Shipbldr—July, 1909. No. 7024 N.

Experiences with Parsons Marine Steam Turbines in Comparison with Reciprocating Engines (Einige Erfahrungen mit Parsons-Marine-Dampfturbinen im Vergleiche mit Kolbendampfmaschinen). Carl Fred Holmboe. Gives a resumé of recent results with turbine-driven vessels. Ills. 2800 w. Zeitschr f d Gesamte Turbinenwesen—July 10, 1909. No. 7288 D.

Some Notes on Parsons Turbine Construction. A. B. Willits. Illustrations of the turbine of the *Preston*, with a study of details of construction. 6000 w. Pro U S Nav Inst—Sept., 1909. No. 8055 F.

The Operation and Management of the Parsons Marine Steam Turbine as Practiced on the U. S. S. Chester. Lieutenant A. F. H. Gates. Gives writer's experience in shops and at sea. Practical details of operation. Ills. 11300 w. Jour Am Soc Nav Engrs—May, 1909. No. 5435 H.

Upkeep of the Parsons Marine Steam Turbines of the U. S. S. Chester. A. F. H. Yates. Reviews the history of the turbines to show the reasons for conditions, describing the repairs. Ills. 4500 w. Jour Am Soc of Nav Engrs—Aug., 1909. No. 8094 H.

Submarines

The Turbines of the Battleship "North Dakota." Illustrated description of the Curtis turbines installed on this ship of the "Dreadnought" type. 1000 w. Sci Am—April 17, 1909. No. 3946.

12,500 H. P. Turbines of the "North Dakota." Illustrated description of the Curtis marine type turbines of 25000 h. p. 2500 w. Power—May 25, 1909. No. 4977.

7400-Horse-Power Zoelly Marine Turbine. Data, particulars and illustrations of the design. 700 w. Engng—Aug. 13, 1909. No. 7325 A.

The Schulz Turbine (Die Schulz-Turbine). Carl Züblin. Describes the latest design for marine purposes and gives test results. Ills. 2800 w. Schiffbau—July 14, 1909. No. 7284 D.

A Method of Determining Pressures for Steam-Turbines. C. H. Peabody. Gives a method of determining directly the pressures of a compound steam turbine, taking into account the increase of entropy due to steam friction. 2500 w. Soc of Nav Archts & Marine Engrs, No. 2—June, 1909. No. 5678 N.

See also Destroyers, Dockships, Steam Engines and Steamships, under MARINE AND NAVAL ENGINEERING.

Steering Gear.

The Steering of the Ship. A study of steering gear and its operation. 3500 w. Marine Rev—March 4, 1909. No. 3008.

Submarine Mines.

Submarine Mines and Mining. Richmond P. Davis. Describes these mines and methods of mining, discussing in detail the factors and their use in harbor defense. Ills. 6500 w. Jour Am Soc of Nav Engrs—Aug., 1908. No. 659 H.

Submarines.

Submarine Naval Warfare. G. Laurenti. An illustrated review of the development of the submarine boat. 5500 w. Cassier's Mag—Nov., 1908. (Special No.) No. 403 D.

Submarine Navigation. Lindell T. Bates. A brief review of the development of the submarine vessel. Ills. 1500 w. Yale Sci M—April, 1909. No. 4373 C.

The Latest Submarines of the United States Navy. Illustrated detailed description of the "Narwahl." Also an article on "An All-Seeing Eye for the Submarine." 2500 w. Sci Am—Oct. 23, 1909. No. 8585.

Progress in Submarine Craft. Robert C. Skerrett. Information concerning British, French and Italian developments

Submarines

and general statistics. 1800 w. *Ir Age*—Jan. 7, 1909. No. 1493.

Underwater Torpedo Boats. Lawrence Spear. Historical review and full discussion of modern submarine and submersible boats. Ills. 22000 w. *Jour Am Soc of Nav Engrs*—May, 1909. No. 5433 H.

Twenty Miles Under the Sea. Editorial giving an account of a run below the surface of the water, in a submarine. 1500 w. *Sci Am*—Aug. 21, 1909. No. 7145.

Develop the Submarine! Edwin Swift Balch. A brief discussion of the naval problem of the present, and the importance of the submarines in harbor defense, urging the United States to follow the lead of Great Britain and France in the development of the submarine. 2500 w. *Jr Fr. Inst*—Aug., 1909. No. 7030 D.

Transportation of Submarines. W. J. Baxter. Describes an actual, successful and economical solution of the problem of over-sea transportation of submarines. 4 plates. 1000 w. *Soc of Nav Archts & Marine Engrs*, No. 17—Nov., 1908. No. 275 N.

The Italian Submersible Boat "Otaria." Brief illustrated description. 400 w. *Engng*—Jan. 1, 1909. No. 1707 A.

General Considerations in the Design of Submarines (Allgemeine Gesichtspunkte für Entwurf von Unterseebooten). K. Dietze. The first part gives details of existing and projected submarines of all navies. Ills. Serial, 1st part. 2800 w. *Schiffbau*—Aug. 11, 1909. No. 7967 D.

See also Dockships and Internal-Combustion Engines, under MARINE AND NAVAL ENGINEERING.

Submarine Signalling.

Submarine Signalling. Present development of methods. 1500 w. *Jour Am Soc of Nav Engrs*—May, 1909. No. 5434 H.

Protection Against Fog Dangers at Sea. J. Erskine Murray. An illustrated account of the development of submarine signalling. 4500 w. *Cassier's Mag*—Dec., 1908. No. 946 B.

Electrically-Operated Submarine Bells. Illustrates and describes bells installed by the French Service des Phares. 800 w. *Engr, Lond*—Jan. 1, 1909. No. 1712 A.

The Application of Electricity to Submarine Signalling. Discusses need of some electrical sounder for efficient submarine signalling. 2000 w. *Elec Rev, Lond*—May 28, 1909. No. 5420.

Superheating.

Superheated Steam in Marine Work. F. J. Rowan. Illustrates and describes superheater constructions and applications. 4500 w. *Int Marine Engng*—July, 1909. Serial, 1st part. No. 6074 C.

Torpedoes

Survey Vessels.

Non-Magnetic Survey Yacht Carnegie. Henry J. Gielow. Illustrated description of this vessel, being built for use in ocean surveys to determine the magnetic conditions of deep-water seas. 2500 w. *Rudder*—May, 1909. No. 4591 C.

The Nonmagnetic Ship "Carnegie." E. A. Dixie. Illustrated description of vessel built for the investigation of terrestrial magnetism. 3000 w. *Am Mach*—Vol. 32, No. 34. No. 7346.

Tank Steamers.

Holmes' Tube Tanker—A New Form of Construction for Tank Steamers Carrying Petroleum in Bulk. Samuel Holmes. Explains the main features of a new form proposed. 2500 w. *Marine Rev*—Nov. 5, 1908. No. 152.

Design of a Vessel for Oil Transport (Entwurf eines Petroleum-Transport-Fahrzeuges). G. Zeys. Describes the design of a tank steamer of 700 tons capacity. Ills. Serial, 1st part. 2800 w. *Schiffbau*—April 28, 1909. No. 4878 D.

Torpedo Boats.

A New Type of Torpedo Boat. Hudson Maxim. Read before the Am. Chem. Soc. Describes a proposed design for a submersible torpedo boat with a destructible bow. Ills. 2000 w. *Int Marine Engng*—March, 1909. No. 3012 C.

New Type of Sub-Surface Torpedo Boat. Illustration with description of a 25-knot boat, having the motors and torpedoes in a pear-shaped, submerged hull. 1000 w. *Sci Am*—April 10, 1909. No. 3838.

Surface or Submarine Torpedo Boats. Brief discussion of their development, claims and performance. 2000 w. *Engr, Lond*—Nov. 13, 1908. No. 448 A.

Torpedoes.

The Torpedo—A Machine Shop Triumph. Samuel Aronson. History of its development and illustrated description of the Bliss-Leavitt torpedo. 4000 w. *Am Mach*—Vol. 32. No. 41. No. 8798.

The Automobile Torpedo in Coast Defense. Richmond P. Davis. Brief review of development, discussing its usefulness, the launching, sub-marine boats, etc. Ills. 2500 w. *Jour U S Art*—March-April, 1909. No. 3801 D.

Torpedo Attack. A brief illustrated account of recent tests made by the Italian government. 800 w. *Engng*—Aug. 13, 1909. No. 7330 A.

The Testing of Automobile Torpedoes (Batterie des Maures, Ilot artificiel de Lancement pour Essais de Torpilles automobiles). M. Michel-Schmidt. A detailed description of a launching station erected in Léoube bay, and the methods of

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Torpedo Testing

testing. Ills. 14000 w. Mem Soc Ing Civ de France—Jan., 1909. No. 4203 G.

Torpedo Testing.

Reinforced-Concrete Torpedo-Testing Station in the Bay D'Hyeres, near Toulon, France. Abstract translation of a paper by M. Michel-Schmidt. Illustrates and describes construction details. 3000 w. Eng News—July 8, 1909. No. 6224.

Torpedo Battery in the Mediterranean. Illustrated detailed description of the French experimental station at Léoube Bay, with related information. 4000 w. Engr, Lond—April 23, 1909. No. 4467 A.

The Schneider Torpedo-Testing Station. Illustrations and description of a proving-station, on the French coast, for testing automobile torpedoes. 4000 w. Engng—Aug. 6, 1909. No. 7104 A.

Torsion Meters.

See same title, under MECHANICAL ENGINEERING, MEASUREMENT.

Towing.

Towing Problems. Thomas S. Kemble. On determining the requirements arising from given towing conditions, and the manner in which a towing machine and cable of given size will meet the requirements. Ills. & diagrams. 5000 w. Soc of Nav Archts & Marine Engrs, No. 8—June, 1909. No. 5683 N.

Tugs.

A Large Sea-Going Tug. Illustrated description of the "Mary F. Scully," built at Staten Island. 1200 w. Int Marine Engng—Feb., 1909. No. 2262 C.

U. S. Merchant Marine.

The Rehabilitation of the American Merchant Marine. Samuel Holmes. Reviews briefly the history of the American mercantile marine, explaining the present situation. 3500 w. Naut Gaz—Jan. 28, 1909. Serial. 1st part. No. 2166.

United States Navy.

A Short Account of Legislative Action in Regard to the United States Navy Up to the War of 1812, and Notes Concerning the Histories of Naval Vessels During That Period. A. Farenholt. 7000 w. Pro U S Naval Inst—Dec., 1908. No. 1337 F.

The Engineering Question in the United States Navy. Critical discussion of the abolition of the bureau system and the control of engineering work by the naval constructor. 4000 w. Engineering Magazine—March, 1909. No. 2783 B.

Amateur Reorganization in the United States Navy. Criticism of recent changes, especially discussing the effect in navy yards. 4000 w. Engineering Magazine—April, 1909. No. 3522 B.

Wrecking Vessel

The Reorganization of the Naval Establishment. J. A. Mudd. Discusses the proper place of the industrial and commercial forces in any reorganization scheme. 1500 w. Pro U S Naval Inst—March, 1909. No. 3548 F.

The Naval Waste. The first of a series of articles on the naval administration of the United States. 3500 w. Marine Rev—Aug., 1909. Serial, 1st part. No. 7049.

Reuter Dahl's Criticism of the Ships of the American Navy (Le Critiche di Reuter Dahl alle Navi della Marina Americana). L. Barberis. A general discussion. Ills. 7500 w. Riv Marit—Nov., 1908. No. 1128 E + F.

The Fusion of the Line and Engineer Officers in the United States Navy (Il Corpo unico, la Fusione degli Ufficiali di Vascello e Macchinisti della Marina Nord-Americana). A. Levi Bianchini. An Italian opinion. 7000 w. Riv Marit—May, 1909. No. 5743 E + F.

"Victory."

Nelson's Flagship Victory. G. Pinhorne. Illustrated detailed description and historical account. 4000 w. Int Marine Engng—Sept., 1909. No. 7616 C.

Yachts.

Taniwha—112 ft. Twin Screw Gasolene Propelled Private Yacht. Illustrated description. 800 w. Naut Gaz—March 18, 1900. No. 3259.

The New American Magnetic Survey Yacht Carnegie. Explains the need of frequent examination of the state of magnetism of the earth, and gives illustrated description of a vessel specially designed for the work. 2200 w. Naut Gaz—Jan. 28, 1909. No. 2165.

Warships.

Early War Steamers. Illustrates and describes the early steam-propelled vessels engaged in warfare. 2500 w. Int Marine Engng—Sept., 1909. No. 7614 C.

Recent Warship Development. Benjamin Taylor. Reviews the output of British shipyards since 1907. 2000 w. Int Marine Engng—Sept., 1909. No. 7618 C.

Wave Pressures.

Lateral Wave Pressure on Ships (Einfluss des Wellendruckes auf die seitliche Schiffswand). Karl Beschoren. A theoretical discussion. Ills. 3200 w. Schiffbau—May 26, 1909. No. 5774 D.

Wrecking Vessel.

Submarine Wrecking Vessel. Illustrated description of a new type built for the recovery of certain sunken treasure. 1000 w. Sci Am—May 1, 1909. No. 4330.

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Acetylene Generators.

Points on the Care of Acetylene Generators. Suggestions concerning their practical management. Ills. 1600 w. Auto Jour—Sept. 11, 1909. Serial. 1st part. No. 7846 A.

Adams.

A Good Car for the Moderate Man. Illustrated detailed description of the 14-16 h. p. Adams, a British built car. 2500 w. Auto Jour—March 27, 1909. No. 3773 A.

Adler.

The 12 h. p. Adler. Illustrated description of a light 4-cylinder car. 1200 w. Autocar—April 3, 1909. No. 3891 A.

Albion.

The 24-30 h. p. Albion Car. Illustrates and describes a car of Scottish origin. 2000 w. Autocar—June 19, 1909. No. 6026 A.

Argyll.

The 12-14 h. p. Four-Cylinder Argyll. Illustrated description of a medium-priced car, with report of an officially observed run over the Scottish trials course. 3000 w. Autocar—July 17, 1909. No. 6661 A.

Armstrong-Whitworth.

The 18-22-H.P. Armstrong-Whitworth Car. Illustrated detailed description of the latest model of these cars. 1200 w. Auto Jour—March 20, 1909. No. 3596 A.

Austin.

Austin Pullman Landaulet. Illustrations with brief description of an entirely enclosed car. 300 w. Autocar—March 20, 1909. No. 3600 A.

Axles.

Bevel-Geared Live Back Axles for Motor Cars. Discusses important points in their design, methods of construction, certain defects, and related matters. Ills. 4000 w. Engng—Nov. 6, 1908. Serial, 1st part. No. 322 A.

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Brakes

The Section of Fixed Axles for Motor Cars. Compares the advantages of the various sections now used, studying the stresses. 1500 w. Engng—March 5, 1909. No. 3163 A.

Determining the Dimensions of the Rear Axles of Motor Cars with Cardan Gear (Beiträge zur rechnerischen Bestimmung der Dimensionen von Hinterachsen an Motorwagen mit Kardantrieb). Ills. Serial, 1st part. 3000 w. Zeitschr d Mit Motorwagen Ver—June 15, 1909. No. 6593 D.

Babcock.

Silent Running Babcock Electric. Illustrated detailed description. 1400 w. Automobile—Oct. 7, 1909. No. 8421.

Belsize.

The 14-16 h.p. Belsize. Illustrated description of a medium powered car. 1500 w. Autocar—Jan. 30, 1909. No. 2338 A.

Benz.

The Latest Mannheim Production. Illustrated description of the leading features in the 18 h. p. Benz engine. 700 w. Auto Jour—Aug. 7, 1909. No. 7083 A.

Berliet.

The 15-H.P. Live-Axle Berliet. Illustrated detailed description. 1600 w. Auto Jour—Feb. 13, 1909. No. 2578 A.

Bodies.

Body Builders Now Exercising Much Ingenuity. Illustrations and remarks on recent designs. 1400 w. Automobile—July 8, 1909. No. 6214.

Brakes.

Modern Trend of Design in Motor Brakes. Lawrence Whitcomb and Thomas J. Fay. Read before the Soc. of Auto. Engrs. Discusses the design of brakes in connection with the clutch. 4500 w. Automobile—Feb. 18, 1909. No. 2533.

The Pulling-Up Powers of a Car. Reports some actual tests with the brakes of modern motor vehicles. Ills. 1600 w.

Brass Founding

Auto Jour—Feb. 20, 1909. Serial. 1st part. No. 2873 A.

Brass Founding.

The "Bohl" Process of Casting Brass and Other Metals in Plaster of Paris Molds. E. L. H. Bohl. Describes the process and illustrates work accomplished. 2200 w. Brass Wld—Oct., 1909. No. 8837.

Brixia-Zust.

An Italian Car of the "Four-Inch" Class. Photographs and description of the 25-H. P. Brixia-Zust. 1500 w. Auto Jour—May 1, 1909. No. 4596 A.

Brush.

Brush Line Expanded for 1910. Discusses the mechanical features of the Brush cars. Ills. 2500 w. Automobile—Oct. 14, 1909. No. 8786.

B. S. A.

The B. S. A. Cars. Illustrated description of the two models made. 1200 w. Autocar—Oct. 31, 1908. No. 172 A.

Bugatti.

The Bugatti Automobile (Automobiles Bugatti). A. Heller. Illustrated description of this car built by the Gasmotoren-fabrik at Deutz. 2000 w. Génie Civil—Nov. 7, 1908. No. 1122 D.

Cabs.

Walter Christie's Front-Drive Autocab. Illustrated detailed description. 2800 w. Automobile—June 10, 1909. No. 5505.

Motor Cabs in London (Ergänzendes über die Londoner Motordroschken). Herbert Bauer. Reviews progress since the end of 1907. Ills. 3200 w. Zeitschr d Mit Motorwagen Ver—Sept. 30, 1909. No. 8671 D.

Cadillac.

Quantity Production and Quality in Car Construction. Illustrated description of a low-priced 20-30 h. p. Cadillac car. 1200 w. Auto Jour—Oct. 16, 1909. Serial. 1st part. No. 8852 A.

Carburettors.

The Formation of Gasoline Air Mixtures. Discusses vaporization and the considerations affecting it. 5000 w. Automobile—Dec. 31, 1908. No. 1458 C.

The Flow of Liquid Fuel Through Carburettor Nozzles. Robert W. A. Brewer. Reports a series of investigations made to show how it becomes an easy matter to ascertain the size of carburettor orifice to satisfy the conditions of cylinder and carburettor dimensions, and to point out some interesting problems in connection with the carburettor. Plates. 5500 w. Soc of Engrs—Nov. 2, 1908. No. 283 N.

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Commercial Vehicles

Improving Carburetor Flexibility. H. L. Towle. Considers some spring characteristics and how to improve running at low speeds. 2200 w. Automobile—Oct. 7, 1909. No. 8419.

What to Do When the Carburetor Won't Work. Morris A. Hall. An illustrated discussion of sources of troubles and the remedies. 3500 w. Automobile—April 22, 1909. No. 4144.

Experiments with a Glass Carburettor. J. S. V. Bickford. Diagrams and description of experimental investigations. 3500 w. Engr, Lond—Aug. 6, 1909. No. 7108 A.

The Zenith Carburettor. Illustrated description of an automatic carburettor for which the designers claim that absolute self-regulation is obtained without the introduction of auxiliary air or the use of any moving parts. 1800 w. Auto Jour—Jan. 30, 1909. No. 2342 A.

Novelty in Carburettor Design. Illustrated detailed description of the "Polyrhoe" expanding carburettor. 4500 w. Auto Jour—Sept. 18, 1909. No. 8107 A.

Distinctive Carburettor Development. Illustrated description of the latest Gillett-Lehmann model. 3500 w. Auto Jour—Oct. 9, 1909. No. 8850 A.

Chalmers-Detroit.

Chalmers-Detroit 1910 Presentation. Illustrates and describes new features introduced. 2000 w. Automobile—Aug. 19, 1909. No. 7157.

Clutches.

See same title, under MACHINE ELEMENTS AND DESIGN.

Commercial Vehicles.

Recent Developments in Motor Vehicles for Industrial Purposes. Harry Wilkin Perry. Illustrates and describes some of the adaptations to special uses. 6000 w. Engineering Magazine—Dec., 1908. No. 671 B.

Twelve Years' Progress in Commercial Vehicles. E. Shrapnell Smith. Read before the Royal Auto. Club, London. A review of progress, cost, performance, etc. 3500 w. Automobile—Dec. 17, 1908. No. 1029.

The Evolution of the Industrial Vehicle (L'Evolution du Véhicule industriel). M. G. Lumet. Report of the 1908 commercial-vehicle competition of the Automobile Club of France. Ills. 7000 w. Mem Soc of Ing Civ de France—Oct., 1908. No. 1303 G.

Energy Consumption of Commercial Vehicle. Alex. Churchward. Read at meeting of Soc. of Auto. Engrs. Deals with the principal factors influencing the required horse-power. 1000 w. Automobile—Aug. 12, 1909. No. 7041.

MECHANICAL ENGINEERING

Commercial Vehicles

The Commercial Truck vs. the Horse. Benjamin Rogers. Information in regard to expense of operation, advantages, etc. 1500 w. Sci Am—Jan. 16, 1909. No. 1775.

On the Subject of Commercial Vehicle Bodies. Morris A. Hall. Illustrated discussion of the causes which determine the type of body fitted to machines for carrying freight or passengers. 3000 w. Com Veh—Aug., 1909. Serial, 1st part. No. 6874 C.

Getting Familiar with the Motor Truck. Stanley Rosebery. A discussion of the parts of the gas motor truck and their functions. Ills. 3500 w. Com Veh—Aug., 1909. No. 6875 C.

Automobile Fire Apparatus (Feuerwehr-automobile). Illustrated description of German models of hose wagons, ladder trucks, etc. 3500 w. Zeitschr d Mit Motorwagen-Ver—Nov. 15, 1908. No. 1175 D.

Motor Ambulances (Automobil-Krank-enwagen). Illustrated description of German models. 2200 w. Zeitschr d Mit Motorwagen-Ver—Nov. 15, 1908. No. 1173 D.

International Commercial Vehicle Competition of the Austrian Automobile Club in 1908 (Internationale Lastwagenkonkurrenz des Oesterreichischen Automobilklubs im Jahre 1908). Johann Trnovsky. Describes the vehicles entered, the tests and the results. Ills. Serial. 1st part. 4400 w. Oest Wochenschr f d Oeffent Baudienst—March 6, 1909. No. 4282 D.

The International Commercial Vehicle Competition (Die internationale Motorlastwagen-Wettbewerb und die Subventionsfahrt der Verkehrstruppen). Describes the competing cars and gives results of the trials. Ills. Serial, 1st part. 3600 w. Zeitschr d Mit Motorwagen Ver—May 15, 1909. No. 5776 D.

Details of New York Motor Mail Service. Describes the service and vehicles. Ills. 1600 w. Com Vehicle—July, 1909. No. 6103 C.

Grabowsky's 3 Ton Power Wagon. Illustrated detailed description. 2000 w. Automobile—Oct. 21, 1909. No. 8791.

A Heavy Oil Motor Wagon. Illustrated description of a vehicle for use in South America. 1200 w. Engr, Lond—Jan. 22, 1909. No. 2225 A.

The "Stae" Electric Automobile (Carri elettrici "Stae"). Describes various types of heavy electric trucks built at Turin, Italy. Ills. Serial, 1st part. 2000 w. Elettricita—March 18, 1909. No. 4239 D.

See also Omnibuses and Tractors, under AUTOMOBILES; and Street Cleaning, under CIVIL ENGINEERING, MUNICIPAL.

AUTOMOBILES

Daimler

Competitions

The Scottish Automobile Club Reliability Trial. A report of the trial, giving tabulated particulars of cars and their performance. 4500 w. Engng—July 16, 1909. No. 6686 A.

Construction.

How to Convert a Horse-drawn Buggy Into a Motor Buggy for Less than \$300. George Heron. Illustrated detailed description of the work. 1500 w. Sci Am—Jan. 16, 1909. No. 1780.

Manufacture of Automobile Bodies. Illustrated brief discussion of details. 800 w. Wood Craft—April, 1909. No. 3729.

Pointers from the Manufacture of Automobile bodies. Illustrated article describing details of manufacture. 1500 w. Wood Craft—April, 1909. No. 3730.

See also Shop Practice, under MACHINE WORKS AND FOUNDRIES.

Corbin.

New Corbin Makes Its Bow for 1909. Charles B. Hayward. Illustrated description of new features. 1500 w. Automobile—Dec. 10, 1908. No. 916.

Corbin Appears in 1910 Form. Details of changes in the new models are given, describing the different types. Ills. 2200 w. Automobile—Aug. 26, 1909. No. 7377.

Cottin-Desgouttes.

The 22 h. p. Cottin-Desgouttes Car. Illustrated detailed description of this French built car. 1400 w. Autocar—Aug. 21, 1909. No. 7425 A.

Crank Shafts.

See same title, under MACHINE ELEMENTS AND DESIGN.

Crossley.

The New 12-14 h. p. Crossley Chassis. Illustrated description. 1200 w. Autocar—June 26, 1909. Serial, 1st part. No. 6267 A.

Daimler.

The Daimler Engine Test. An illustrated account of the first stage of the trial. 900 w. Autocar—March 27, 1909. No. 3774 A.

Official Results of the Daimler Engine Tests. A report of a very severe series of tests, successfully endured with virtually no wear. Ills. 1200 w. Auto Jour—April 17, 1909. No. 4189 A.

The 1909 Daimler Cars at Olympia. Illustrates and describes the chassis. 1000 w. Auto Jour—Nov. 14, 1908. No. 418 A.

Darracq

AUTOMOBILES

Electric

Darracq.

The 14-H.P. Darracq Car. Illustrated description. 800 w. Auto Jour—March 13, 1909. No. 3433 A.

De Dion.

The 12-14 h. p. Four-Cylinder De Dion Car. Illustrated description of a model designed after general De Dion practice. 1800 w. Autocar—Sept. 11, 1909. No. 7847 A.

Dennis.

The 18 h. p. Four-Cylinder Dennis. Illustrated description of a medium-powered car embodying the worm drive. 1200 w. Autocar—July 24, 1909. No. 6831 A.

Dennis.

Unsolved Problems of the Motor Car. Col. H. C. L. Holden. Abstract of "James Forrest" lecture before the Inst. of Civ. Engrs. Deals principally with the problems awaiting solution. 2500 w. Auto Jour—May 1, 1909. Serial, 1st part. No. 4599 A.

Motor Body Building. Discusses the difference between a good and bad body. Ills. 4400 w. Autocar—Oct. 2, 1909. No. 8470 A.

Progress in Car Design. Some illustrated notes of the mechanical details of the historical cars at Shepherd's Bush. 1600 w. Autocar—Sept. 18, 1909. No. 8105 A.

The Peculiar Requirements of Peculiar Countries. A symposium of opinions of the conditions under which motor cars must be used. The present article deals with Canada and the Federated Malay States. 1800 w. Autocar—May 1, 1909. Serial, 1st part. No. 4600 A.

Improved Forms of the Buggy Type Automobile. Illustrates and describes types of motor buggies and their power plants. 2000 w. Sci Am—March 20, 1909. No. 3246.

Recent Progress in Automobile Design (Neuere Automobilkonstruktionen). Fritz Meitner. The first instalment describes the new Adler four-cylinder motor. Ills. Serial. 1st part. 800 w. Motorwagen—Sept. 10, 1909. No. 8674 D.

The Torpedo Body. Its Evolution and Possibilities. Illustrated description of Capt. Masui's design for a new type of body. 600 w. Autocar—May 8, 1909. No. 4703 A.

Immunity from Side-Slip. Illustrated description of the "Safety" chassis, a practical development of the live front axle. 2000 w. Auto Jour—April 24, 1909. No. 4443 A.

See also Shop Practice, under MACHINE WORKS AND FOUNDRIES.

Driving.

How to Drive a Motor Car. The first of a series of articles giving practical hints on the driving of motor vehicles. 4500 w. Auto Jour—Oct. 31, 1908. Serial, 1st part. No. 173 A.

Some Pertinent Hints for the American Autoist. Calls attention to important points to be considered by autoists. 2500 w. Automobile—Dec. 10, 1908. No. 917.

Dust Problem.

Trapping the Insidious Dust. W. R. Cooper. An illustrated account of an investigation of the air currents about a motor car in motion. Read before the Royal Automobile Club. 2200 w. Auto Jour—May 22, 1909. No. 5183 A.

Electric.

The Electric Vehicle Motor. J. T. Deremer. Read before the Pacific Coast Elec. Veh. Assn. Considers the motor, its controller, and their connection with each other. 2200 w. Elec Rev, N Y—April 17, 1909. No. 3997.

Electric Automobile Motors and Controllers. Alex Churchward. Considers the design, types, method of control, &c. 1500 w. Elec Rev, N Y—June 12, 1909. No. 5480.

Operation and Care of Vehicle Batteries. H. M. Beck. Read at meeting of Soc. of Auto. Engrs. Detailed discussion of care needed by storage batteries, and explanation of their operation. 4000 w. Automobile—Aug. 12, 1909. No. 7040.

The Mileage Radius of Electric Vehicles. Frank B. Rae. Considers the determining factors. 1800 w. Elec Rev, N Y—March 6, 1909. No. 3006.

Abuses of Storage Batteries in Electric Vehicle Work. Walter L. Thompson. Considers the principal forms of abuse. 2000 w. Elec Rev, N Y—April 10, 1909. No. 3866.

The Relations Between Central Stations and the Electric Automobile. A summary of replies to questions sent out, giving data in regard to the charging of electric vehicles. 9500 w. Elec Wld—Aug. 5, 1909. No. 6905.

New Nickel-Iron Battery Withstands Tests. Describes this Edison battery and reports tests. 2000 w. Automobile—July 15, 1909. No. 6364.

The New Battery Charging Station at the Montague Street Garage of the Brighton, Hove & Preston United Omnibus Co. Illustrated description of the Stevens' charging set adopted. 1800 w. Elect'n, Lond—June 25, 1909. No. 6277 A.

MECHANICAL ENGINEERING

Electric

Electric Automobiles (Ueber Elektromobile). E. Sieg. Gives a historical review of their development and discusses the various systems. Ills. Serial. 1st part. 1800 w. *Elektrotech Zeitschr*—Dec. 24, 1908. No. 2114 D.

Modern Electric Automobiles (Moderne Elektromobile). K. Schirmbeck. Illustrates and describes recent types. 3600 w. *Zeitschr d Mit Motorwagen-Ver*—Jan. 15, 1909. No. 2800 D.

See also Commercial Vehicles, Fire Apparatus, and Garages, under AUTOMOBILES.

Electric Batteries.

Management of Electrical Vehicle Batteries. H. M. Beck. Read at meeting of Soc. of Auto. Engrs. Suggestions and instructions for those in charge of the operation and upkeep of electric vehicles. 2500 w. *Com Veh*—Sept., 1909. Serial. 1st part. No. 7496 C.

See also Current Rectifiers, under ELECTRICAL ENGINEERING, DISTRIBUTION.

Electric Dynamos.

The Dynamo. Illustrates and describes a new system of making electricity on the car. 1200 w. *Auto Jour*—Jan. 30, 1909. No. 2341 A.

Electric Equipment.

Electric Equipment of Steam and Gasoline Automobiles. F. R. Babcock. An account of the various devices, combinations and arrangements which have been used for illumination, signalling, speed changing, etc. 3000 w. *Jour W Soc of Engrs*—Oct., 1908. No. 355 D.

E. N. V.

French Newcomer with Aerial Engine. Illustrated notes of a car to be built in France, which in many details departs from current practice. 2500 w. *Automobile*—May 6, 1909. No. 4534.

Exhibitions.

Level on Which Merit Stands Is Contested. Thomas J. Fay. Calls attention to marks of progress evident in the exhibits at the Palace exhibition in New York. Ills. 2500 w. *Automobile*—Jan. 7, 1909. No. 1591.

The Mechanical Lesson of the Palace. Thomas J. Fay. A general review of the exhibits at the Grand Central Palace, New York City. Ills. 7500 w. *Automobile*—Dec. 31, 1908. No. 1457 C.

Lessons from the Motor-Car Show at Olympia. A general review of the progress shown. 3500 w. *Engng*—Dec. 4, 1908. No. 1019 A.

AUTOMOBILES

Fire Apparatus

Motor-Car Exhibition at Olympia. Illustrates and describes interesting exhibits of pleasure cars and accessories. 1500 w. *Engr, Lond*—Nov. 20, 1908. Serial. 1st part. No. 743 A.

Historical Motor Cars. Description of an interesting collection of typical vehicles gathered for the Imperial International Exhibition at Shepherd's Bush. Ills. 2700 w. *Motor Car Jour*—May 29, 1909. No. 5438 A.

Automobile Progress in 1908 (Les Progrès de l'Automobilisme en 1908). F. Drouin. Illustrated review of progress and improvements as shown at the Paris "Salon." Serial. 1st part. 3200 w. *Génie Civil*—Jan. 16, 1909. No. 2641 D.

Aeronautics and Commercial Vehicles at the Paris "Salon" (Le Salon de l'Aéronautique et des Véhicules industriels). G. Espitallier. Describes some of the exhibits. Ills. 5500 w. *Génie Civil*—Jan. 9, 1909. No. 2639 D.

Explosions.

The Danger of Explosion in Automobiles (Zur Frage der Explosionsgefahr bei Automobilen). Herr Effenberger. Discusses the explosions to which the automobile is liable and means of lessening the dangers, giving results of tests. Ills. 5500 w. *Zeitschr d Mit Motorwagen-Ver*—Nov. 15, 1908. No. 1174 D.

Farm Motors.

A Machine of Absorbing Interest to Farmers. Illustrated description of a "hay-buck," invented by Jacob E. Liebhart. The machine is propelled by an automobile engine, and may perform all its functions with the assistance of two men. 1200 w. *Automobile*—June 10, 1909. No. 5503.

An Egyptian Cultivator. A machine of original construction is described. Ills. 1200 w. *Sci Am*—Feb. 13, 1909. No. 2399.

See also Tractors, under AUTOMOBILES.

Fire Apparatus.

New American Motor Fire Apparatus. Illustrated descriptions of extension ladder, hose wagons, etc., fitted with motors. 1200 w. *Com Vehicle*—Nov., 1908. No. 46 C.

Electric Automobile Fire Apparatus of the Berlin Fire Department (Der elektromobile Löschzug der Berliner Feuerwehr). Illustrated description. Serial. 1st part. 1800 w. *Zeitschr d Mit Motorwagen Ver*—April 15, 1909. No. 5054 D.

Motor Fire Apparatus in Hamburg (Feuerwehr-Automobile in Hamburg). Describes a number of recent vehicles.

MECHANICAL ENGINEERING

Fire Engines

Ills. 3100 w. *Zeitschr d Mit Motorwagen Ver*—Sept. 30, 1909. No. 8672 D.

See also under **COMMERCIAL VEHICLES**.

Fire Engines.

Development of the Gas Motor Fire Engine. An illustrated article describing details of some recent machines. 2500 w. *Com Veh*—Sept., 1909. No. 7495 C.

A German Automobile Fire Engine. Illustrated description with report of experiments in Frankfort. 1200 w. *Sci Am Sup*—Sept., 25, 1909. No. 8081.

France.

The Automobile Crisis in France (*La Crise automobile en France*). E. Girardault. Discusses the causes and probable results of the present unsatisfactory state of the automobile industry. Ills. 3300 w. *Génie Civil*—Dec. 19, 1908. No. 1930 D.

Fuels.

Automobile Gasoline and Other Available Fuel. Thomas J. Fay. Considers the amount of gasoline for a given case, radius of travel, economy, etc., in the present number. Ills. 3500 w. *Automobile*—April 15, 1909. Serial. 1st part. No. 3969.

Automobile Gasolene Involves Complex Problems. Thomas J. Fay. Discusses automobile fuel, the composite character of the gasolene used, some peculiarities, etc. Ills. 2500 w. *Automobile*—April 8, 1909. No. 3826.

Doping Petrol and How to Detect It. Horatio Ballantyne. Abstract of a paper entitled "Some Chemical Notes on Petrol," read before the Inst. of Auto. Engrs. Reviews attempts to improve petrol as a fuel for internal combustion motors. 2400 w. *Auto Jour*—April 3, 1909. No. 3890 A.

How to Save the Petrol Tax. Deals with fuel-saving practices and economizing devices. Ills. 3000 w. *Auto Jour*—May 15, 1909. No. 4940 A.

Heat Values of Ordinary Automobile Fuels. Dr. Fritz Huth. Trans. from *Der Motorwagen*. Illustrated description of the Junker calorimeter and its use in determining the heat value of fuels. 1200 w. *Automobile*—June 10, 1909. No. 5504.

See also **Coking Py-Products**, under **MINING AND METALLURGY, COAL AND COKE**.

Fuel Storage.

The Storage of Combustible Liquids (*Die Lagerung feuergefährlicher Flüssigkeiten*). Discusses the precautions necessary in handling and storing combustible liquids and describes appliances for the

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purpose. Ills. 6000 w. *Oest Wochenschr f d Oeffent Baudienst*—Dec. 5, 1908. No. 1975 D.

Garages.

The Electric Garage. S. P. Read. Read before the Pacific Coast Elec. Vehicle Assn. Discusses the necessity of an electric garage where electric vehicles are used, the requirements, arrangements, costs, etc. 1500 w. *Elec Rev, N Y*—April 3, 1909. No. 3748.

Efficient Equipment of Private Motor Houses. Explains the value of a few special machines. Ills. 1200 w. *Auto Jour*—July 31, 1909. No. 6965 A.

Some Solutions of the Private Garage Problem. Morris A. Hall. Suggestions in regard to buildings, tools needed, and related matters. Ills. 2800 w. *Automobile*—Oct. 21, 1909. Serial. 1st part. No. 8789.

The Heating of Motor Houses. Illustrates and describes various devices. 1800 w. *Autocar*—Dec. 5, 1908. No. 1003 A.

The Automobile in the Garage (*Das Automobil in der Garage*). H. von Eicken. A discussion of garage location, equipment, etc. Ills. Serial, 1st part. 3600 w. *Zeitschr d mit Motorwagen Ver*—May 15, 1909. No. 5775 D.

Gasoline-Electric.

Gasoline Electric Automobiles. Justus B. Entz. Briefly reviews systems in which the prime mover is a gasoline engine, and electricity used as a supplementary power, especially describing the Entz electric transmission system. Ills. 3000 w. *Jour Fr Inst*—July, 1909. No. 6355 D.

Gasoline Meters.

The Smith Petrol Meter. Illustrated description of a valuable accessory for a motor car. 2000 w. *Auto Jour*—March 6, 1909. No. 3146 A.

Gears.

Toughened Gears for Automobiles. J. M. Howe. Describes process of hardening and tempering used in Europe with "Mangano Siliceux" steel. 1000 w. *Am Mach*—Vol. 31. No. 51. No. 1075.

Which is Better: Three or Four Speeds? Louis Lacoïn. Gives the changes on the chassis needed for the fourth speed, and discusses its advantages in saving fuel and time. Ills. 2500 w. *Automobile*—April 15, 1909. No. 3970.

Treatment of Gears for Automobile Motors and Transmissions. Harold Whiting Slauson. Illustrates and describes the

Gear Testing

practice at a number of factories. 2000 w. Mach, N Y—Oct., 1909. No. 8287 C.

Differential Gears for Motor-Cars. A critical discussion of the types in general use. Ills. 1600 w. Engng—Feb. 26, 1909. No. 3063 A.

The Janney Hydraulic Gear for Automobiles. Described from the patent specification by Eric W. Walford. Ills. 700 w. Autocar—April 3, 1909. No. 3892 A.

Gear Testing.

Testing Gear for Automobiles. M. E. Hidgegan. Illustrated description of a device for the final testing of all spur-cut gears, either soft or hardened. 1000 w. Am Mach—Vol. 32, No. 34. No. 7350.

Germain.

The 20 h.p. Germain. Illustrated description of new type of light 6-cylinder car. 1400 w. Autocar—Feb. 13, 1909. No. 2577 A.

A Small 6-Cylinder Car from Belgium. Illustrates and describes the leading features of the 20 h. p. Germain. 900 w. Auto Jour—Sept. 11, 1909. Serial. 1st part. No. 7844 A.

Gregoire.

The 14-H.P. Gregoire Petrol Car. Illustrated description of a low-priced French car. 1000 w. Auto Jour—Dec. 19, 1908. No. 1384 A.

Headlights.

The Bleriot "No Glare" Headlight. Illustrated description of a "No-glare" automobile lamp. 700 w. Auto Jour—Dec. 19, 1908. No. 1383 A.

Hillman-Coatalen.

The 12-15 h. p. Hillman-Coatalen Car. Illustrated description of a car of the 4-cylinder type. 1200 w. Autocar—April 24, 1909. No. 4442 A.

Holsman.

Holsman High-Wheelers for 1910. Illustrates several types and describes the driving mechanism. 2000 w. Automobile—Sept. 9, 1909. No. 7706.

Humber.

A Speedy Sixteen. Illustrated description of the new 16 h. p. model of the Humber Co. 1200 w. Auto Jour—July 10, 1909. No. 6413 A.

Hupmobile.

Hupmobile from a New Home. Illustrates and describes Model B, the design for 1910. 1500 w. Automobile—Oct. 21, 1909. No. 8790.

AUTOMOBILES

Ignition.

How a Magneto Makes Electricity. P. S. Tice. An illustrated explanation of the principles involved and the method of operation in the production of ignition sparks in the modern magneto. 2000 w. Autocar—Aug. 28, 1909. Serial. 1st part. No. 7639 A.

High Tension Ignition by Magneto. Roger B. Whitman. Illustrates and describes typical magnetos used in American cars. 3000 w. Sci Am—Jan. 16, 1909. No. 1776.

The Bosch Magnetic Igniter. Illustrated description of this system. 1500 w. Auto Jour—Dec. 12, 1908. No. 1098 A.

Getting Acquainted with Make and Break Ignition. Herbert L. Towle. An illustrated explanation of the make and break system. 2500 w. Rudder—Dec., 1908. No. 900 C.

Helpful Hints on Ignition Topics. Morris A. Hall. Explains important parts of the ignition systems and troubles of each. Ills. 2500 w. Automobile—May 20, 1909. Serial, 1st part. No. 4793.

Ten Years' Progress in Magneto Ignition. J. A. Williams. Discusses the subject of electric ignition. 2500 w. Automobile—Feb. 25, 1909. No. 2771.

The Development of Magneto Ignition. H. G. Deupree. A review of the three successive steps marking the progress. Ills. 2500 w. Automobile—July 1, 1909. No. 6113.

Multi-point Ignition. R. W. Ayton. An explanation by the originator. 1800 w. Autocar—Aug. 7, 1909. No. 7086 A.

Dual Ignition Systems and Switch Starting-Devices. Gives information about devices which supplement magnetos, and an illustrated description of the Bosch dual-ignition system. 2000 w. Auto Jour—May 22, 1909. Serial. 1st part. No. 5181 A.

Some Hints on Ignition Testing. C. Wadsworth. Illustrates and describes the Hoyt voltammeter, explaining how it simplifies ignition testing. 2500 w. Automobile—Sept. 16, 1909. No. 7796.

How I Fitted a Magneto to a Small Runabout. Joseph Tracy. Drawings and description. 1000 w. Automobile—Aug. 19, 1909. No. 7155.

Misfiring: Some Causes and Some Remedies. Stillman Taylor. Discusses causes that contribute to misfiring and the remedies. 2500 w. Automobile—Oct. 14, 1909. No. 8784.

Dry Cells and the Advantages of Multiple Batteries for Ignition. A. L. Haskell. Read before the N.t. Gas Eng. Trds.

MECHANICAL ENGINEERING

Imperia

Assn. Explains what has been accomplished in the manufacture of dry batteries and the applications where they have proved satisfactory. 4500 w. Gas Engine—Aug., 1909. No. 7021.

See also Lighting, under AUTOMOBILES.

Imperia.

The Imperia Petrol Cars. Illustrated description of a 16-20 h.p. car built in Belgium. 1000 w. Auto Jour—Dec. 26, 1908. No. 1505 A.

Inspection.

Preparing a Car Systematically for the Road. D. R. Hobart. Suggestions in regard to the attention a car should receive before starting. 800 w. Automobile—April 29, 1909. No. 4349.

Itala.

The 16-20 h.p. Itala. Brief illustrated description. 600 w. Autocar—Feb. 6, 1909. No. 2475 A.

Jackson.

Jackson Projects for 1910. Illustrates and describes the new models of this company. 1800 w. Automobile—Oct. 14, 1909. No. 8787.

Knox.

1910 Knox Pleasure Cars. Interesting details are illustrated and described. Engines water-cooled, aluminum crank case, etc. 2500 w. Automobile—July 29, 1909. No. 6779.

Laboratories.

Laboratory in Automobile Making. Thomas J. Fay. Considers some of the requirements in a laboratory, the testing necessary, and the general utility of such a laboratory. Ills. 3000 w. Automobile—Sept. 16, 1909. No. 7795.

Lamps.

What Lamp Should a Motorist Buy? The Candle-Powder Problem. An explanation of phenomena produced by light. Diagrams. 1600 w. Auto Jour—Jan. 16, 1909. Serial. 1st part. No. 2048 A.

Lanchester.

The New Wheel-Steering Lanchester Car at Olympia. Illustrates and describes a 6-cylinder vehicle equipped with wheel steering and gate control. 1700 w. Auto Jour—Nov. 28, 1908. No. 849 A.

Lancia.

The Lancia Petrol Cars at Olympia. Illustrated description of these Italian touring cars. 1200 w. Auto Jour—Nov. 14, 1908. Serial, 1st part. No. 422 A.

AUTOMOBILES

Lighting

The Lancia Car. A 15-h. p. four-cylinder, and 30-h. p. six-cylinder engined chassis are described and illustrated. 1400 w. Autocar—Nov. 7, 1908. No. 300 A.

Laurin-Klement.

Three Laurin and Klement 1909 Models. Brief illustrated descriptions of the 14-16 h.p., 10-12 h.p., and 10 h.p. cars. 900 w. Autocar—March 6, 1909. No. 3148 A.

An Austrian Twin-Cylinder Runabout. Illustrates and describes the 10-h. p. Laurin-Klement car. 500 w. Auto Jour—Aug. 14, 1909. No. 7196 A.

Light Cars.

Light Cars (Das Kleinauto). Herr Schwerdtfeger. Discusses their development and suggests means of simplifying their construction. Ills. 2800 w. Zeitschrift Mit Motorwagen Ver—Jan. 30, 1909. No. 2801 D.

Lighting.

Tests of Headlights for Motor Car and Motor Cycles. A report of tests and conclusions under the open competition rules of the Royal Automobile Club. 2500 w. Autocar—Aug. 21, 1909. No. 7426 A.

Fog-Penetrating Head-Lamps. Illustrated description of the "Silverlyte" electric system of burying a lamp in a lens. 1200 w. Auto Jour—May 1, 1909. No. 4597 A.

Head-Lamps at the Crystal Palace. Reports of efficiency and of non-dazzling properties. Ills. 2500 w. Auto Jour—July 24, 1909. No. 6830 A.

Electric Light for Motorists. Illustrated description of the Bleriot self-contained automatic installation. 1200 w. Auto Jour—May 8, 1909. No. 4665 A.

The Bleriot Lighting and Charging Dynamo. Illustrates and describes a machine for supplying current to the car lamps and for ignition purposes. 1500 w. Autocar—May 15, 1909. No. 4939 A.

Electric Lighting for Automobiles. Morris A. Hall. An illustrated account of the progress made in the use of electricity for car lighting. 1800 w. Automobile—June 3, 1909. No. 5231.

Economy Results from Understanding Acetylene. Discusses phases of lighting by means of acetylene, with particular reference to calcium carbide. Ills. 2500 w. Automobile—March 25, 1909. No. 3504.

"Rushmore" Headlamps and Generators. Illustrates and describes features of these lamps and generators. 2500 w. Auto Jour—Sept. 4, 1909. No. 7725 A.

MECHANICAL ENGINEERING

Lubrication

An All-British Electric Plant for Car Lighting. Illustrated description of a complete ignition and lighting system, with an ingenious constant voltage (Leitner) dynamo. 2000 w. Auto Jour—May 15, 1909. No. 4941 A.

See also Acetylene Generators, under AUTOMOBILES.

Lubrication.

Lubrication. J. W. G. Brooker. Abstract of paper considering points on lubrication. 2200 w. Auto Jour—March 6, 1909. Serial. 1st part. No. 3147 A.

Automobile Lubrication.—Some Elementary Principles. Thomas D. Hanauer. The importance of systematic lubrication, lubricants, and related subjects are discussed. Ills. 3500 w. Sci Am—Jan. 16, 1909. No. 1778.

Some Facts About Mechanical Lubricators—Troubles and Cures. An illustrated discussion of functional and organic troubles. 1500 w. Auto Jour—Aug. 28, 1909. No. 7638 A.

Grease or Oil in Transmission Gears? H. L. Towle. A discussion of the effectiveness of the two lubricants for this use. Ills. 2000 w. Automobile—Aug. 19, 1909. No. 7154.

See also, Motor Lubrication, under AUTOMOBILES.

Martini.

A Swiss Solution of the Small Car Problem. Illustrated description of the latest 10-12 h. p. Martini model. 1200 w. Auto Jour—July 3, 1909. No. 6290 A.

Mass.

The 1909 Mass Petrol Cars at Olympia. Illustrates and describes the interesting features of these cars. 1200 w. Auto Jour—Nov. 14, 1908. No. 420 A.

Maudslay.

A Coventry-Built Seventeen. Illustrated detailed description of the 17 h. p. Maudslay car. 1700 w. Auto Jour—Oct. 9, 1909. No. 8851 A.

Maxwell.

"Maxwell" Model Q. Illustrated description. 1300 w. Automobile—July 15, 1909. No. 6365.

Metallurgic.

A Long-Stroke Twenty-Six. An illustrated description of the latest four-inch metallurgic. 1500 w. Auto Jour—July 31, 1909. No. 6964 A.

Metallurgique.

The 12-H.P. Metallurgique Car. Illustrated description of a two-passenger car shown at Olympia. 700 w. Auto Jour—Jan. 9, 1909. No. 1799 A.

AUTOMOBILES

Moline.

Moline Model "M" 1910. Information concerning these high-grade cars, selling at \$1500. 1700 w. Automobile—Sept. 23, 1909. No. 8040.

Mora.

One 1910 Mora "Light Four." Illustrated description of a four-cylinder chassis to be constructed by this Newark firm. 2000 w. Automobile—Sept. 9, 1909. No. 7705.

Motobloc.

The 14-H. P. Motobloc Petrol Car. Brief illustrated description. 600 w. Auto Jour—Aug. 14, 1909. No. 7195 A.

Motor Balancing.

Balancing Petrol Motors. Considers some of the means of diminishing vibration. Ills. 1800 w. Autocar—July 10, 1909. No. 6403 A.

Motor Cooling.

Concerning Air-Cooling as Opposed to Water-Cooling. Arthur Holmes. A criticism of statements in an earlier article by Morris A. Hall. 1800 w. Automobile—April 22, 1909. No. 4146.

Winter Troubles with Cooling Water. States the properties of a satisfactory cooling medium, considering the solutions at present used. 2500 w. Automobile—Nov. 19, 1908. No. 370.

Non-Freezing Solution for Radiators. J. E. Stacey Jones. Practical tests and recommendations. 1600 w. Autocar—Nov. 14, 1908. No. 423 A.

The Effect of Glycerine on the Cooling Water of an Engine. Henry O'Connor. Gives report of an investigation which showed no effect on the cooling power below 180°. 600 w. Autocar—Jan. 2, 1909. No. 1685 A.

An Experiment in Air-Cooling. Illustrated description of the system of E. H. Morgan, which induces a draft through the cylinder jackets by the action of the exhaust, and increases the radiation in hot places by coating them with a chemical. 1200 w. Auto Jour—May 8, 1909. No. 4666 A.

Cooling Automobile and Aeronautical Motors (Die Kuhlung der Automobil und Flugmotoren). F. Ernstes. Illustrated description of a large number of arrangements for air and water cooling. Serial. 1st part. 6000 w. Zeitschr d Mit Motorwagen Ver—March 31, 1909. No. 4277 D.

Motor Control.

A Few Observations on Engine Control. A study of various systems. Ills. 1500 w. Autocar—Feb. 20, 1909. No. 2874 A.

Motor Control

MECHANICAL ENGINEERING

Motor Cylinders

Motor Cylinders.

Functions and Fraillties of Motor Cylinders. Thomas J. Fay. The present number discusses the correct designing of cylinders. Ills. 2000 w. Automobile—July 1, 1909. Serial, 1st part. No. 6112.

Motor Efficiency.

Thermal and Combustion Efficiency of a Motor. Prof W. Watson. Abstract of a paper giving results and deductions of a thorough test recently made. 3000 w. Automobile—June 10, 1909. No. 5501.

Motor Exhausts.

Exhaust Pipe Arrangement. Considers the effect of the exhaust on the engine. Ills. 1500 w. Autocar—Aug. 7, 1909. No. 7085 A.

Motor Governing.

The Governing of Automobile Motors (Zur Regelung von Automobil-Gasmaschinen). R. Lutz. A discussion of devices for speed regulation. Ills. 3300 w. Zeitschr d Ver Deutscher. Ing—April 17, 1909. No. 5075 D.

Motor Lubrication.

Lubrication of Gasoline Vehicle Motors. J. W. G. Brooker. From a paper before the Roy. Auto Club. A practical discussion. 3000 w. Com Veh—June, 1909. No. 5214 C.

The Lubrication of Petrol Motors. Explains the conditions of the problem, and describes systems used. Ills. 2500 w. Engng—June 18, 1909. No. 6043 A.

See also, Lubrication, under AUTOMOBILES.

Motor Power.

Increasing Motor Power per Unit of Mass. G. Lumet. Reviews the factors that increase the mechanical efficiency of a motor. 2000 w. Automobile—March 4, 1909. No. 2967.

Motor Rating.

The Rating of Petrol Engines. Editorial discussion of formula rating. 2000 w. Engng—Nov. 13, 1908. No. 444 A.

The Computation of Engine Horse-Power Rating Formulae. Report of W. Worby Beaumont on horse-power rating and the present situation with regard to it. 4500 w. Engr, Lond—May 21, 1909. No. 5201 A.

The Horse-power of Petrol Engines. C. F. Dendy Marshall. Explains the steps

leading to the rating formula $\frac{D^2 S N}{12}$.

1200 w. Autocar—Sept. 18, 1909. No. 8106 A.

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Motors.

Phenomena of Combustion in the Engine Cylinder. Explains the function of the explosive mixture, treating the subject qualitatively rather than quantitatively. 3000 w. Autocar—Sept. 25, 1909. No. 8334 A.

The Two-Cycle Automobile Motor. E. W. Roberts. Illustrates and describes types, explaining the term. 2000 w. Sci Am—Jan. 16, 1909. No. 1779.

Combustion Motors of Large Power Per Unit of Weight (Les Moteurs à Mélange tonnant à grande Puissance mas-sique). M. G. Lumet. Discusses the factors which influence the relation between weight and power and gives the results of some tests carried out by the Automobile Club of France. Ills. 6000 w. Mem Soc Ing Civ de France—Oct., 1908. No. 1304 G.

Comparing Long and Short Stroke Motors. E. A. Myers. Showing the desirability of the long stroke. 1800 w. Automobile—Dec. 24, 1908. No. 1266.

The Ultimate Internal Combustion Motor and Its Probable Fuel. Thomas L. White. Calls attention to new lines of research and the present outlook. 1800 w. Ir Age—Jan. 7, 1909. No. 1494.

Bore and Stroke. Discusses the pros and cons of long and short strokes. 1800 w. Autocar—March 20, 1909. No. 3599 A.

Exhaust side of Automobile Motors. Thomas J. Fay. The present number considers exhaust manifolds used in water-cooled motors. Ills. 1000 w. Automobile—June 10, 1909. Serial. 1st part. No. 5500.

Flexibility Desirable in Automobile Motors. E. Girardault. A study of the factors bearing upon this quality, and the influence upon the design of the car, and particularly on the change-speed gear. 2000 w. Automobile—July 22, 1909. No. 6634.

Direct Fuel Injection Two-Cycle Motors. Thomas J. Fay. Discusses the advantages of directly injected fuel, the results, etc. Ills. 1500 w. Automobile—Oct. 14, 1909. No. 8785.

The Daimler Company's New Engine. C. Y. Knight. Abstract of paper read before the Roy. Auto Club. An account of the development of the ideas and a reply to criticisms. 7500 w. Auto Jour—Oct. 24, 1908. No. 63 A.

A Constant Pressure Engine. Morris A. Hall. Illustrated description of the Stilz constant pressure internal combustion engine. 1500 w. Automobile—July 8, 1909. No. 6213.

MECHANICAL ENGINEERING

Motors

A Five-Cylinder Engine and Gearless Car. Section and description of the invention of A. Gore, with explanation of how he has been able to make forced induction a success. 2200 w. Autocar—July 31, 1909. No. 6966 A.

New and Novel Designs in French Motors. W. F. Bradley. Illustrated descriptions of the Aries 4-cylinder motor, and of the Korwin & Rebikoff 3-cycle motor. 1200 w. Automobile—Feb. 18, 1909. No. 2532.

Liquid-Fuel Motors (Fahrzeugmaschinen für flüssigen Brennstoff). A. Heller. A general review of the design and construction of automobile, motor boat, motor car, and airship motors. Ills. 5000 w. Zeitschr d Ver Deutscher Ing—July, 24, 1909. No. 7474 D.

See also Benzine Motors, under COMBUSTION MOTORS; Piston Rings, under MACHINE ELEMENTS AND DESIGN; Shop Practice, under MACHINE WORKS AND FOUNDRIES; and Cast Iron, under MATERIALS OF CONSTRUCTION.

Motor Starting.

Self Starting Devices. Illustrates and briefly describes the important features and methods of operation of the principal self-starting devices now in use. 2200 w. Automobile—April 1, 1909. No. 3679.

Motor Testing.

A Handy Testing Chart. Arranged by Roger B. Whitman to show the effect of various troubles in automobile engines and how to remedy them. 700 w. Sci Am Sup—July 10, 1909. No. 6242.

Indicator Cards and What They Denote. Thomas J. Fay. Analysis of indicator cards and to investigate automobile motors. 4500 w. Automobile—June 24, 1909. No. 5881.

Tests of High-Speed Combustion Motors (Essai des Moteurs à Explosion à grande Vitesse). J. Izart. Describes the apparatus and methods used by M. Rinzelman. Ills. 2000 w. L'Elec—July 24, 1909. No. 7222 D.

See also Daimler, under AUTOMOBILES.

Motor Tests.

A Series of Tests on a White Steam Car. C. H. Benjamin and G. A. Young. A report of tests made to determine h. p. output in terms of engine rating and economy at different speeds and loads. Ills. 3000 w. Am Mach—Vol. 32. No. 19. No. 4635.

Test of Pierce Water-Cooled Motor. J. A. Lührman and G. W. Woodward. Paper read at Chicago meeting of Soc.

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of Auto. Engrs. Detailed description of the methods of testing, with tables of results. 5500 w. Automobile—Sept. 23, 1909. No. 8038.

N. A. G.

The 12-14-H.P. N.A.G. Car. Illustrated description of a German Chassis. 1200 w. Auto Jour—Dec. 5, 1908. No. 1005 A.

Cars of the Neue Automobil-Gesellschaft (Die Personenwagen der Neuen Automobil-Gesellschaft). O. Winkler. Describes novel features of the 25-36 h.p. car. Ills. 2200 w. Zeitschr d Ver Deutscher Ing—Feb. 13, 1909. No. 3563 D.

Napier.

The 1909 Napier Petrol Cars at Olympia. Illustrated description of the 30 h. p. 6-cylinder model. 1200 w. Auto Jour—Nov. 7, 1908. No. 297 A.

A 6-Cylinder Car for the Colonies. Illustrates and describes the leading features of the 30 h. p. Napier. 1000 w. Auto Jour—Aug. 21, 1909. No. 7427 A.

Omnibuses.

The Use of the Motor Omnibus in Europe. Information from a report by Mr. Mauclere, presented at the Munich Congress of the Int. Union of St. Rys. & Light Rys. 1500 w. Eng News—Dec. 31, 1908. No. 1406.

Motor Passenger-Vehicles. J. F. Gairns. Illustrates and describes recent developments in motor omnibuses, and some of their uses. 5000 w. Cassier's Mag—March, 1909. No. 2923 B.

The Advantages and Disadvantages of Motor Omnibuses. Results of Working. K. Otto. 3300 w. Bul Int Ry Cong—July, 1909. No. 8024 G.

The Advantages & Disadvantages of Motor Omnibuses. Results of Working. Mr. Mauclère. 13500 w. Bul Int Ry Cong—July, 1909. No. 8023 G.

Motor Omnibuses in London (Die Stellung der Motoromnibusse im öffentlichen Verkehr Londons). Herbert Bauer. A review of their development, traffic handled, etc. Ills. 2500 w. Zeitschr d Mitt Motorwagen Ver—Aug. 31, 1909. No. 7980 D.

Economy and Operating Costs of Electric Motor Buses (Wirtschaftlichkeit und Betriebskosten elektrischer Autobusse). B. v. Lengerke. Results of tests in Berlin. Ills. Serial. 1st part. 1500 w. Motorwagen—Sept. 10, 1909. No. 8673 D.

Progress in the Construction of Motor Omnibuses and Heavy Motor Trucks (Fortschritte im Bau von Motoromnibussen und schweren Motorlastwagen). A.

Opel

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Selden

Heller. Illustrated description of various recent types. Serial. 1st part. 4000 w. Zeitschr d Ver Deutscher Ing—Dec. 5, 1908. No. 1998 D.

Opel.

The 40-H. P. Opel Petrol Car at Olympia. Illustrated description. 1500 w. Auto Jour—Nov. 14, 1908. No. 421 A.

Packard.

Packard Cars for 1910. Illustrates and describes the latest type of Packard "Thirty," showing new phaeton body and features of the motor. 2500 w. Automobile—May 20, 1909. No. 4794.

Panhard.

The 12-15 h. p. Panhard Car. Illustrated description of a new car. 1200 w. Autocar—Oct. 2, 1909. No. 8469 A.

Pearson-Cox.

A New British-Built Steam Car. Illustrated detailed description of the 12 h. p. low-priced car of Pearson and Cox. 3000 w. Auto Jour—April 3, 1909. No. 3889 A.

Peerless.

The Peerless Motor Cars for 1910. Illustrated article describing improvements introduced. 1800 w. Automobile—July 29, 1909. No. 6778.

Pierce-Arrow.

Pierce Arrows for 1909. Illustrates and describes the new features introduced and new types. 3000 w. Automobile—Dec. 17, 1908. No. 1031.

Pierce-Arrow for 1910. Illustrates and describes improvements, introduced in new models. 2200 w. Automobile—Sept. 2, 1909. No. 7554.

Pope-Hartford.

Pope-Hartford Model T for 1910. A 4-cylinder, 40-h. p. car to be made in six body types. 1500 w. Automobile—Aug. 12, 1909. No. 7042.

Pressure Indicators.

Pressure Indicator for Motor-Car Engines. Illustrates and describes an instrument of French origin, called the "Acrometer." 600 w. Engng—Oct. 30, 1908. No. 194 A.

Pullman.

Pullman in Several 1909 Models. Brief illustrated descriptions. 1600 w. Automobile—Dec. 24, 1908. No. 1264.

Pumps.

See Radiators, under AUTOMOBILES.

Radiators.

Up-to-Date Accessory Features of Radiators and Pumps. Thomas J. Fay. De-

scribes the radiators of the McCord Mfg. Co. Ills. 2000 w. Automobile—Oct. 21, 1909. Serial. 1st part. No. 8788.

Rambler.

New Rambler Models for 1910. An illustrated description of new cars, calling attention to new features. 2000 w. Automobile—Oct. 7, 1909. No. 8420.

Regal.

Regal in 1909 Form. Charles B. Hayward. Illustrates and describes new features. 1200 w. Automobile—Dec. 24, 1908. No. 1265.

Reo.

Four Cylinder Reo Makes Its Bow. Illustrated description of a new design, known as Model R, rated at 30-35 h. p. 6000 w. Automobile—Aug. 5, 1909. No. 6916.

Repairs.

Kinks and Wrinkles for the Autoist. D. R. Hobart. Suggestions for emergencies and repairs during touring. 2500 w. Automobile—June 24, 1909. No. 5882.

What to Do When the Fuel Pipe Breaks. D. R. Hobart. Explains methods of temporarily repairing. Ills. 1500 w. Automobile—June 17, 1909. No. 5588.

Ingenuity in the Making of Repairs. Oliver Light. Sketches and suggestions for making quickly various automobile repairs. 2000 w. Automobile—Aug. 26, 1909. No. 7376.

Helpful in Overhauling the Car. Stillman Taylor. Suggestions for cleaning and inspection, and reassembling. 3500 w. Automobile—Sept. 2, 1909. No. 7553.

Rider-Lewis.

Rider-Lewis Sixes. Morris A. Hall. Illustrated description of features. 1500 w. Automobile—July 22, 1909. No. 6637.

Road Trains.

The Renard Road and Rail Transport Corporation, Limited. A letter giving a report of trials in India. 2500 w. Min

Rolls-Royce.

Reliability and Refinement. Illustrates and describes the Rolls-Royce improvements for the year 1910. 2200 w. Auto Jour—June 12, 1909. Serial. 1st part. No. 5626 A.

Selden.

What Is the Selden Patent? Charles B. Haywood. An explanation, with illustrated descriptions of types of Selden cars. 2500 w. Sci Am—March 20, 1909. No. 3248.

MECHANICAL ENGINEERING

Shock Absorbers

Shock Absorbers.

The General Utility of Shock Absorbers. Thomas J. Fay. Considers types, methods, maintenance, and cost. Ills. 2200 w. Automobile—Nov. 19, 1908. No. 369.

Shock Absorbers (Les Amortisseurs). E. Girardault. Description and discussion of various types. Ills. Serial, 1st part. 4000 w. All Indus—June, 1909. No. 6543 D.

Siddeley.

The New Siddeleys. Describes improvements, and also a new model. Ills. 2000 w. Autocar—Oct. 24, 1908. No. 61 A.

Six-Cylinder 20-Horse-Power Siddeley Motor-Car. Illustrated detailed description of car for the Olympia exhibition. 1800 w. Engng—Nov. 6, 1908. No. 324 A.

Six-Wheeled.

Six-Wheeled Automobiles (Voitures Automobiles à Six Roues). M. Janvier. Discusses the advantages of the six-wheeled vehicle, their construction, steering, etc. Ills. 4000 w. Bul Soc d'Encour—Oct., 1908. No. 519 G.

Sizaire-Naudin.

The 12-H. P. Sizaire-Naudin Light Car at Olympia. Illustrated description of a single-cylinder, low power and low price car. 1000 w. Auto Jour—Nov. 14, 1908. Serial. 1st part. No. 419 A.

Sleighs.

Motoring on Runners. Illustrates and describes experimental motor sleds. 1500 w. Sci Am—Feb. 27, 1909. No. 2780.

Speed Changing.

A New Speed-Changing Device for Automobiles (Nouvel Appareil de Changement progressif de Vitesse pour Automobiles). M. P. Hoffet. Illustrated description of a new Swiss device. 2000 w. Bul Tech d l Suisse Romande—Oct. 10, 1908. No. 525 D.

Speed Changing in Automobiles (Les Changements de Vitesse des Automobiles). E. Girardault and J. Bethenod. A theoretical discussion of the choice of change-speed gears. Ills. 3200 w. Génie Civil—April 17, 1909. No. 4839 D.

Speed Indicators.

A Tip Concerning Speedometer Equipment. Suggests a direct-drive, oil-bath, open-scale arrangement. Ills. 1500 w. Auto Jour—May 1, 1909. No. 4598 A.

Speed Measuring Devices for Automobiles and Locomotives (Geschwindigkeitsmesser für Motorfahrzeuge und Lo-

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Stevens-Duryea

komotiven). Herr Pflug. Discusses their use, requirements, and the various classes. 4500 w. Glaser's Ann—April 15, 1909. No. 5057 D.

See also Speed, under ELECTRICAL ENGINEERING, MEASUREMENT.

Speedwell.

1909 Speedwell. Illustrated detailed description, calling attention to recent improvements. 1500 w. Automobile—Feb. 11, 1909. No. 2439.

Springs.

About Automobile Spring Suspensions. Thomas J. Fay. An illustrated discussion of types of springs and their action. 1500 w. Automobile—Nov. 5, 1908. Serial. 1st part. No. 117.

Springs (Des Resorts). M. Marchesseau. Mathematical discussion of the design of automobile springs. 2300 w. All Indus—Feb., 1909. No. 3327 D.

Standardization.

Standard Automobile Parts Adopted by the A. L. A. M. With data supplement. Special specifications for a standard spark plug, and for adjustable and solid yoke and eye rod ends, and a h. p. formula. 400 w. Mach, N Y—Oct., 1909. No. 8286 C.

Stanley.

Building the Stanley Steamer. Illustrates and describes interesting details of boilers and other features. 1500 w. Am Mach—Vol. 32. No. 23. No. 5385.

Stearns.

Concerning the Stearns 15-30. Illustrates and describes details of the "New Series" 15-30. 1500 w. Automobile—Sept. 23, 1909. No. 8039.

Steering.

Notes on Steering Mechanism. Diagrams and discussion of some of the problems encountered. 3500 w. Autocar—Aug. 14, 1909. No. 7194 A.

Steering Gears.

Safety and Utility of Automobile Steering Systems. Thomas J. Fay. An examination of the various systems. Ills. 2000 w. Automobile—March 11, 1909. Serial. 1st part. No. 3089.

Some Observations on the Steering Gear. Thomas J. Fay. Discusses points of design and construction. 1600 w. Automobile—Sept. 30, 1909. No. 8228.

Stevens-Duryea.

1910 Stevens-Duryea. Illustrated description of the 6-cylinder, 40-h.p. car called Model Y. 2000 w. Automobile—July 22, 1909. No. 6635.

Straker-Squire

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Thomas

Straker-Squire.

The 1909 14-16 H. P. Straker Squire. Illustrated description. 1500 w. Autocar—Dec. 26, 1908. No. 1504 A.

A Striking British Fourteen. Illustrated detailed description of the Straker-Squire touring car. 800 w. Auto Jour—Sept. 25, 1909. No. 8335 A.

Sunbeam.

The New 12-16 h. p. Sunbeam. Illustrated description of a live-axle car with 80 x 120 m. m. four-cylinder engine and four speeds. 1500 w. Autocar—Oct. 16, 1909. No. 8855 A.

Talbot

15 H. P. Four-Cylinder Talbot Car. Description of the 1909 model. Ills. 2300 w. Autocar—May 29, 1909. No. 5449 A.

The 35 h. p. Four-Cylinder Talbot. Illustrates and describes particulars of the largest Talbot model. 1200 w. Autocar—Oct. 16, 1909. No. 8854 A.

Testing.

The Use of Electricity in Testing Automobiles. Dr. Alfred Gradenwitz. Illustrated description of the dynamometer plant used by the Am. Auto. Club. 1500 w. Elec Rev, Lond—Dec. 11, 1908. No. 1207 A.

Tire Pressures.

Effect of Speed on Tire Pressures. Charles B. Hayward. Explains the effect when a tire punctures under ordinary and under high speed conditions. Ills. 2200 w. Automobile—June 10, 1909. No. 5502.

Tires.

True Story of the Automobile Tire. H. S. Firestone. A brief account of methods of gathering rubber and preparing it for use, the combination with cotton in making tires, etc. Ills. 1400 w. Automobile—Feb. 11, 1909. No. 2438.

The Making of Automobile Tires. Snowden B. Redfield. Illustrated description of modern machinery and methods used. 4500 w. Am Mach—Vol. 32. No. 30. No. 6759.

About the Auto's Indispensable Footwear. Suggestions from a book by C. A. Shaler relating to care, repairs, etc. 2500 w. Automobile—Dec. 17, 1908. No. 1030.

The Manufacture and Care of Tires (Das Wichtigste über den Kautschuk, die Fabrikation und Pflege der Pneumatiks). Dr. K. Dieterich. Shows the importance of the tire problem and the advantages and defects of rubber as a tire material. 4500 w. Zeitschr d Mit Motorwagen Ver—April 15, 1909. No. 5053 D.

Detachable and Demountable Rims Discussed. Hermann F. Cuntz. Discusses what is being done in this field as a solution of the problem of quickly replacing tires. 1100 w. Automobile—Jan. 21, 1909. No. 1897.

How to Prolong the Life of a Tire. Hiram Percy Maxim. Thinks tires are not properly inflated. Advocates the use of a tire pressure gauge. Ills. 1300 w. Automobile—Nov. 26, 1908. No. 622.

Our Legion Tires and Their Troubles. Orrel A. Parker. Discusses types of tires and their troubles, the effect of proper and improper driving, the importance of selecting tires suitable for the kind of service, etc. Ills. 4000 w. Sci Am—Jan. 16, 1909. No. 1777.

Automobile Pneumatics at the Paris Road Congress (Der Automobilpneumatik auf dem Pariser Strassenkongress). Herr Krastel. Reviews the discussions on the effect of high-speed automobiles on roads, etc. Ills. 2600 w. Motorwagen—Jan. 10, 1909. No. 2803 D.

Resilient Fillings for Tires. A. J. McKinney. A record of a series of investigations and experiments with solid fillings and compound tires. 3000 w. Autocar—June 12, 1909. No. 5639 A.

A Simple Antidote to Tire Troubles. Illustrated article giving details of construction, manipulation, and management of the Dunlop detachable rim. 2500 w. Auto Jour—July 3, 1909. No. 6291 A.

Tyre Problems. D. W. Samways. Read before the Roy. Auto. Club. Analyses the forces acting upon the rim and wheel, and discusses the advantages of a high tyre over a low one. 2000 w. Auto Jour—Oct. 16, 1909. No. 8853 A.

The Alley Tyre Manipulator. Illustrated description of a device for facilitating the dismounting and fitting of tyres. 1000 w. Autocar—Dec. 5, 1908. No. 1004 A.

The Hall and Baynes Detachable Rim. Illustrated description of a device for facilitating speedy tire changes. 700 w. Autocar—March 13, 1909. No. 3401 A.

Thomas.

Thomas Flyer Model "M" 6-40 Touring Car. Illustrates and describes the latest model of the Thomas cars, which will have long-stroke motor. 2200 w. Automobile—Aug. 19, 1909. No. 7156.

A New 6-Cyl. Car from America. Illustrated description of the 40 H. P. Thomas flyer. 1200 w. Auto Jour—May 22, 1909. Serial. 1st part. No. 5182 A.

MECHANICAL ENGINEERING

Traction Engines

Traction Engines.

A Gasoline Caterpillar Traction Engine. Brief illustrated description of engines operating on the Mojave desert in connection with work on the Los Angeles aqueduct and reservoir system. 1000 w. Sci Am Sup—March 6, 1909. No. 3577.

Tractors.

Modern Steam Tractors for Rapid and Light Road Haulage Purposes. William Fletcher. An illustrated article dealing with mechanical haulage on common roads. 4000 w. Cassier's Mag—Jan., 1909. No. 1726 B.

The War Office Tractor Trials. Illustrates and describes the three vehicles that competed on March 1st. 4000 w. Engr, Lond—March 5, 1909. No. 3177 A.

Military Tractor Trials. Reports on the British War Office trials, giving particulars of vehicles entered. 1200 w. Engng—March 5, 1909. Serial. 1st part. No. 3169 A.

The Thornycroft Tractor. Illustrated description of the vehicle entered for the War Office trials. 600 w. Engng—March 5, 1909. No. 3171 A.

Lessons from the Trials of Military Tractors. Editorial on the recently completed War Office trials. 3000 w. Engng—March 19, 1909. No. 3620 A.

A Novel Steam Tractor for Hauling Logs Over Snow. Illustrated description of a machine of the "caterpillar" type, propelled by steam. 600 w. Sci Am Sup—May 1, 1909. No. 4331.

Gas Motor Tractors for Agricultural Work. Henri Godefroy. Illustrates and describes types of machines used for agricultural purposes in the United States and abroad. 3500 w. Con Veh—Aug, 1909. Serial, 1st part. No. 6873 C.

Mechanical Transport in the Colonies. Information from a recently issued Blue Book relating to the possibility of using mechanical transport on the roads in undeveloped regions, price of fuel, water supply, rates of labor and particulars bearing on this subject. 1600 w. Engng—Aug. 13, 1909. No. 7328 A.

Military Steam-Tractor. Illustrates and describes the Stewart steam-tractor. 1000 w. Engng—Oct. 15, 1909. No. 8898 A.

Tractor or Motor Wagon. A discussion of tractors and steam lorries, their suitability, cost, and working costs. 2000 w. Mech Wld—Oct. 8, 1909. Serial. 1st part. No. 8886 A.

Transmissions.

Transmission of Power from Engine to Road Wheels. L. A. Legros. Abstract

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Wheels

of paper before Inst. of Auto. Engrs. Discusses details of transmission from the gear box to the back axle. 2500 w. Automobile—May 13, 1909. No. 4653.

Manly Hydraulic Variable Speed Transmission. Thomas J. Fay. Illustrates and describes this system. 1000 w. Automobile—Dec. 10, 1908. No. 915.

A Hydraulic Variable Speed Transmission. Illustrated detailed description of the Manly Drive, with report of tests. 1700 w. Eng News—Feb. 18, 1909. No. 2523.

Turner-Miesse.

The Turner-Miesse Steam-Car. Illustrated description of a car claiming economy, safety, absence of vibration and easy control. 1800 w. Engng—July 2, 1909. No. 6305 A.

Valve Grinding.

Methods of Valve Grinding. D. R. Hobart. Discusses grinding as a cause of leakage, giving suggestions. Ills. 1500 w. Automobile—July 1, 1909. No. 6114.

Valveless.

The 25-H. P. Valveless Car at Olympia. Illustrated description. 700 w. Auto Jour—Nov. 7, 1908. No. 298 A.

Vauxhall.

A Car Which Has Made a Remarkable Name. Illustrates and describes the leading features of the 20-h. p. Vauxhall. 2200 w. Auto Jour—Aug. 28, 1909. No. 7637 A. Vinot.

The 12-16-H. P. Vinot Car. Illustrated detailed description. 1200 w. Auto Jour—Oct. 24, 1908. Serial. 1st part. No. 62 A.

Vulcan.

The 16 h.p. Vulcan Car. Brief illustrated description of a car of moderate power. 1000 w. Autocar—Feb. 20, 1909. No. 2875 A.

Westinghouse.

The 20-30 H. P. Westinghouse. Illustrates and describes details of the chassis. 1500 w. Autocar—Jan. 9, 1909. No. 1800 A.

Wheels.

Automobile Wheels, Rims and Tires. Thomas J. Fay. Detailed discussion, with illustrations, of the design, and important particulars. 3500 w. Automobile—Sept. 2, 1909. Serial. 1st part. No. 7552.

The Sizes of Wheels in Motor Vehicles. Discusses the considerations which determine the size of wheels used in various vehicles, and the effect of size on effi-

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Wheels

ciency. 3000 w. Engng—Oct. 1, 1909. No. 8480 A.

Handling Detachable Rims. Illustrated directions for replacing inner tubes and outer covers. 800 w. Auto Jour—Aug. 7, 1909. No. 7084 A.

Meritorious Features of Wire Wheels. Joseph A. Mackle. An illustrated description of tests made in England on improved wire wheels. 1800 w. Automobile—Sept. 9, 1909. No. 7704.

A New Spare Wheel. Illustrates and describes the Hall spare wheel, designed so that it can be attached without fitting or deflating the tire. 8000 w. Auto Jour—July 17, 1909. No. 6660 A.

The "Panflex" Spring Wheel for Motor-Cars. Illustrated description of a new type, and its operation. 1000 w. Engng—April 16, 1909. No. 4301 A.

An Important Dunlop Departure. Illustrates and describes a detachable wheel introduced by this firm. 1500 w. Auto Jour—Oct. 2, 1909. No. 8471 A.

Determination of the Diameter and Weight of Automobile Wheels (Détermination du Diamètre et du Poids des Roues). E. Girardault. Discusses the principles of the design of wheels for automobile vehicles for special purposes.

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Ills. 5000 w. Génie Civil—July 10, 1909. No. 7230 D.

White.

The 1909 White Steam Cars at Olympia. Illustrates and describes the 15 h.p. White chassis, and the Joy valve-gear. 2000 w. Auto Jour—Nov. 7, 1908. No. 299 A.

White Cars for 1910 Include a Gasoline. Illustrates and describes the new features of the 1910 models; the most important being the modifications which make possible the use of kerosene or gasoline as fuel. 1500 w. Automobile—June 17, 1909. No. 5587.

See also Motor Tests, under AUTOMOBILES.

Winton.

Winton Six for 1910. This new model shows an improved carbureter, a new front axle, longer wheel base and springs, and other changes. Ills. 2000 w. Automobile—July 22, 1909. No. 6636.

Wolseley-Siddeley.

A 6-Cylinder Car of Moderate Power. Illustrates and describes a new Wolseley model of a low-priced 20-30 h. p. car. 800 w. Auto Jour—July 17, 1909. No. 6659 A.

COMBUSTION MOTORS.

Aeronautical.

See Motor Cooling, under AUTOMOBILES; and Gasoline Engines, under COMBUSTION MOTORS.

Alcohol Storage.

4,000 Cubic Metre Alcohol Storage Tank at Delsberg, Switzerland (Spiritusbehälter von 4,000 m³ Inhalt der Eidg. Alkoholverwaltung Depot Delsberg). Illustrated description. 1500 w. Schweiz Bau—Aug. 21, 1909. No. 7971 B.

Benzine Motors.

The Working Cycle in Automobile Motors (Untersuchung des Arbeitsprozesses im Fahrzeugmotor). Kurt Neumann. Describes and gives the results of an elaborate research on a one-cylinder de-Dion-Bouton benzine motor. Ills. Serial, 1st part. 4400 w. Zeitschr d Ver Deutscher Ing—Feb. 27, 1909. No. 3572 D.

Carburetters.

A New Automatic Carburetter. Illustrated description of the design known as the Polyshoë carburetter. 700 w. Engr, Lond—Oct. 8, 1909. No. 8943 A.

Compression.

Varying the Volume of the Compression Chamber in Internal-Combustion Engines. Illustrates and describes a device invented by E. G. E. Beaumont. 1500 w. Prac Engr—Sept. 10, 1909. No. 7850 A.

Constant-Pressure.

A Constant-Pressure Internal-Combustion Engine. H. B. Stilz. Reviews the theory of these engines and gives an illustrated description of a design by the writer. Also editorial. 6000 w. Eng News—April 22, 1909. No. 4159.

Exhaust Gases.

See Exhaust-Gas Heating, under HEATING AND COOLING.

Fuels.

The Properties of Liquid Fuels. E. B. Norris. A study of the methods of using liquid fuels. 3000 w. Engr, Pa—Dec., 1908. No. 2009 D.

Tests of the Comparative Efficiency of Gas, Gasoline and Alcohol as Fuel in Internal Combustion Engine. Condensed from a thesis for the degree of Bachelor

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of Engineering, submitted by Ralph C. Puckett and Louis Hoth. Ills. 2500 w. Transit—June, 1909. No. 6482 N.

Denatured Alcohol and Its Industrial Applications (*L'Alcool dénaturée et ses Emplois industriels*). Albert Dulac. A review of its production and use as a motor fuel in France. Ills. Serial. 1st part. 2000 w. Tech Mod—Dec., 1908. No. 2633 D.

The Cost of Denatured Alcohol (*Le Prix de Revient de l'Alcool dénaturé*). R. P. Duchemin. A discussion of the cost of the denaturing process using methylene. 2400 w. Tech Mod—March, 1909. No. 4232 D.

The Denomination of Industrial Hydrocarbons (*La Dénomination des Carbures d'Hydrogène employés dans l'Industrie*). E. Lemaire. Discusses the chemical differences between the various motor fuels, etc. 2000 w. Génie Civil—May 15, 1909. No. 5740 D.

Gas Analysis.

Moisture in Producer Gas. J. MacFarlane. Explains methods used by the writer for the determination of moisture. Plate. 1500 w. Jour W of Scotland Ir & Steel Inst—Oct., 1908. No. 895 N.

Gas Calorimetry.

Apparatus for Measuring and Indicating the Explosive and Calorific Values of Gaseous Mixtures. Illustrated description of an apparatus for continuous analysis of gaseous mixtures, recently patented by A. G. Evans. 1400 w. Mech Engr—June 18, 1909. No. 6036 A.

Practical Determination of the Caloric Power of Gaseous Fuels (*Détermination pratique du Pouvoir calorifique des Combustibles gazeux industriels*). Georges Bourrey. Describes the Lemoult apparatus and method. Ills., 3000 w. Tech Mod—May, 1909. No. 5731 D.

See also Calorimetry, under MEASUREMENT.

Gas Cleaning.

See Blast-Furnace Gas, under MINING AND METALLURGY, IRON AND STEEL.

Gas Dangers.

Dangers of Water Gas, Suction Gas, and Other Gases in Factories. Memorandum issued by the Factory Department of the Home Office, giving the causes of such accidents and the best means for their prevention. 3000 w. Mech Engr—Jan. 8, 1909. No. 1811 A.

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Gas-Engine Compression.

Determining the Actual Compression in a Small Gas Engine. George M. Strombeck. Directions for obtaining the compression. 900 w. Mach, N Y—Aug., 1909. No. 6807 C.

Gas Engine Design.

To Determine Size of Gas and Oil Engine Cylinders. Newton Wright. Gives formulae with explanatory notes. 900 w. Mach, N Y—Feb., 1909. No. 2244 C.

Offsetting Cylinders in Single Acting Engines. Discussion of the paper of Prof. Thurston M. Phetteplace. 1500 w. Jour Am Soc of Mech Engrs—Sept., 1909. No. 8101 F.

Gas Engine Efficiency.

A Method of Improving the Efficiency of Gas Engines. Thomas E. Butterfield's paper is discussed. 1000 w. Jour Am Soc of Mech Engrs—Sept., 1909. No. 8100 F.

A Graphical Method of Calculating Gas-Engine Efficiencies. Edward William Hollingworth. An explanation of a method for calculating the theoretical efficiency of gas-engines. 1500 w. Inst of Civ Engrs—No. 3750. No. 2791 N.

Gas-Engine Governing.

Governing Gas Engines. L. B. Lent. Discusses the proper action of the governor and related matters. 1500 w. Power—Dec. 22, 1908. No. 1079.

Gas-Engine Indicators.

Indicating of Gas-Engines. Frederic W. Burstall. Gives comparative results obtained by using simultaneously an indicator of the ordinary string type, and an optical indicator. Ills. Tables. 1500 w. Inst of Mech Engrs—Julv. 1909. No. 6990 N.

Gas-Engine Lubrication.

See Engine Lubrication, under STEAM ENGINEERING.

Gas Engines.

Reminiscences of a Gas Engine Designer. L. H. Nash. Describes some ideas that have been tried, and principles of engine construction. Ills. 4000 w. Jour Am Soc of Mech Engrs—Dec., 1908. No. 840 F.

Recent Developments in Large Gas-Engine Design. Percy R. Allen. The present paper discusses the four-cycle gas engine in British and Continental practice. Ills. 4500 w. Cassier's Mag—July, 1909. Serial, 1st part. No. 6344 B.

Large Gas Engines. P. R. Allen. Abstract of a lecture at the Imp. Int. Ex.,

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Shepherd's Bush. Brief historical review, describing details of construction, and comparing steam and internal combustion engines. 2000 w. *Elect'n, Lond*—Sept. 17, 1909. No. 8113 A.

The Small Two-Stroke Gas Engine. Walter C. Willard. Explains its possibilities in the industrial field and discusses its limitations. Ills. 1800 w. *Ind Engng*—Aug. 15, 1909. No. 7177 C.

Recent Improvements in the Internal-Combustion Engine. H. E. Wimperis. A summary of what has been accomplished, stating the problem and the lines along which its solution has been attempted. 2000 w. *Nature*—Aug. 5, 1909. Serial, 1st part. No. 7080 A.

Large Gas Engines (Les Moteurs à Gaz de grandes Puissances). M. L. Letombe. Discusses their design, the various types, their application, etc. Ills. 1800 w. *Mem Soc Ing Civ de France*—Dec., 1908. No. 3302 G.

Progress in Gas Engine Construction (Les Progrès de la Construction des Moteurs à Gaz). R. E. Mathot. A review of results, objections, certain principles and details of construction, and possible improvements. Ills. 11200 w. *Mem Soc Ing Civ de France*—Jan., 1909. No. 4201 G.

Introduction to the Theory of Explosion Motors (Introduction à l'Etablissement de la Théorie des Moteurs à Explosion). L. Letombe. A discussion of indicator diagrams. Ills. 3000 w. *Tech Mod*—May, 1909. No. 5732 D.

The Theory of Explosion and Combustion Motors (Introduction à l'Etablissement de la Théorie des Moteurs à l'Explosion et à Combustion). L. Letombe. A general discussion. Ills. 4500 w. *Tech Mod*—Jan., 1909. No. 2634 D.

The Waste Heat of the Gas Engine. Cecil P. Poole. Gives a brief analysis of methods of utilizing waste heat, showing the fallacy of assuming that all the waste heat is available. 1600 w. *Power*—Dec. 8, 1908. No. 876.

On Heat-Flow and Temperature—Distribution in the Gas-Engine. Bertram Hopkinson. An experimental investigation into the temperatures reached by the hotter parts of a gas-engine of considerable size, the conditions which determine them, and the circumstances in which pre-ignition may be caused by hot metal. Also abstract of discussion. 26000 w. *Inst of Civ Engrs*—No. 3799. No. 8165 N.

Compression in Gas Engines (Remarques sur la Compression des Moteurs à Gaz). E. Jouguet. A review of the

theories on which the use of high compression is based. Ills. 4500 w. *Rev de Mécan*—March, 1909. No. 4221 E + F.

Gas Engine Compression and Efficiency. Paul C. Percy. Explains why the degree of compression affects the efficiency and economy. 2000 w. *Power*—Jan. 5, 1909. (Special No.) No. 1488 D.

The Influence of Compression Pressure Upon Thermal Efficiencies of Gas-Engines. W. A. Tookey. Letter discussing Prof. Burstall's reports on behalf of the Gas-Engine Research Committee, 3000 w. *Engng*—Oct. 15, 1909. No. 8899 A.

The Work of the British Association Committee on Gaseous Explosions. Dugald Clerk. Read before the Engng. Sec. of the British Assn. at Winnipeg. On the practical application of knowledge acquired by investigation of the properties of gaseous explosions in internal-combustion motors. 3000 w. *Engng*—Sept. 3, 1909. No. 7755 A.

Gaseous Explorations. First report of the Committee appointed by the British Association to investigate gaseous explosions, with special reference to temperature. 5000 w. *Mech Engr*—Jan. 1, 1909. Serial. 1st part. No. 1512 A.

Gaseous Explosions. Second report of the Committee presented to the British Assn. at Winnipeg. Ills. 11500 w. *Engng*—Sept. 3, 1909. No. 7754 A.

Increasing the Efficiency and Capacity of Large Gas Engines by Cooling the Charge. F. E. Junge. Comments on the results of Prof. Junker's investigations to ascertain the influence of charge temperature. 1000 w. *Power*—Feb. 2, 1909. No. 2189.

A Method of Improving the Efficiency of Gas Engines. Thomas E. Butterfield. An account of experiments made to show the effect of dilution of charge with inert gas. 3000 w. *Jour Am Soc of Mech Engrs*—April, 1909. No. 3965 F.

Reciprocating Gas Engines with Previous Compression and Exhaust-Gas Turbines (Kolbengasmaschine mit Vorkompression und Abgasturbine). Felix Langen. Discusses the possibility of combining a gas engine with a low-pressure gas turbine. 2000 w. *Zeitschr f d Gesamte Turbinenwesen*—April 30, 1909. No. 4883 D.

The Internal Combustion Engine. J. Stanley Richmond. Reviews, chapter by chapter, a work written by H. E. Whimperis. 6500 w. *Can Engr*—June 18, 1909. No. 5610.

The Producer Gas and Gas Engine, with Special Reference to the Down-

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Draft Producer. Thomas F. Fitzsimmons. Considers the generation of producer gas from low-grade fuels. 1500 w. *Am Gas Lgt Jour*—July 5, 1909. No. 6102.

Gas Engine Construction for Producer Gas Use. H. F. Smith. Read before the Nat. Gas & Gasoline Eng. Trds. Assn. Discusses the general requirements and certain details of importance. 2000 w. *Gas Engine*—July, 1909. Serial, 1st part. No. 6441.

Gas Engine and Gas Producer. Percival Robert Moses, in *The Isolated Plant*. Showing the present gas engine to be a standard apparatus, both economical and efficient. 2500 w. *Gas Engine*—Aug., 1909. No. 7022.

A New Gas-Engine Cycle. Robert Miller. Describes the cycle devised by the writer, explaining its advantages, and illustrating the Miller single-crank, double-acting gas engine. 2500 w. *Int Marine Engng*—Dec., 1908. No. 752 C.

The 100-Horse Power Gas Engine. T. W. Burt. An illustrated discussion of current British practice in suction producers and engines. 6500 w. *Cassier's Mag*—May, 1909. No. 4402 B.

100 Horse-Power Horizontal Gas Engine. Illustrated description of the latest model of a single-cylinder gas engine built by the National Gas Engine Co., Ltd. 800 w. *Engr, Lond*—Nov. 13, 1908. No. 454 A.

The Griffin Enclosed Gas-Engine. Illustrated description of a two-cylinder three-cycle engine. 800 w. *Engng*—Dec. 4, 1908. No. 1018 A.

The Influence of Large Gas Engines on Steel-Works Development (Einfluss der Grossgasmaschine auf die Entwicklung der Hüttenwerke). A. Bonte. A general review of the use of gas power in steel works with special reference to Germany. 5000 w. *Zeitschr d Ver Deutscher Ing*—Nov. 28, 1908. No. 1197 D.

Westinghouse Gas Engines at Gary. Illustrates and describes the mechanical and operative features of the No. 3 gas-driven blowing plant of the Indiana Steel Co. 6000 w. *Ir Age*—March 4, 1909. No. 2930.

Gas Engines. Mark B. Lamb. Brief description of the Gary plant. Ills. 1700 w. *Min & Sci Pr*—Oct. 2, 1909. No. 8409.

The Gas Engine in Central Station Work. William F. Flint. Read before the Canadian Elec. Assn. Considers the economic possibilities. 2500 w. *Ir Age*—July 22, 1909. No. 6603.

Suction Gas-Engines at the Royal Agricultural Show. Illustrations, with

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description. 500 w. *Engng*—June 18, 1909. No. 6045 A.

The Nurnberg Gas Engine. Abstract of paper by Richard Bechtel, read before the Birmingham (Eng.) Assn. of Mech. Engrs. Reviews the large internal-combustion engines, particularly the Nurnberg engine. Ills. 2500 w. *Cassier's Mag*—Oct., 1909. No. 8468 B.

The Development of the Large Gas Engine. Abstract of the second part of Richard Bechtel's paper on "The Nurnberg Gas Engine." Deals with efficiency and cost of maintenance. Ills. 4000 w. *Ir & Coal Trds Rev*—June 11, 1909. No. 5664 A.

Gas Engines for Mining Purposes. A. S. Atkinson. Brief account of the success attained in the use of gas engine power plants for mines. 1500 w. *Min & Sci Pr*—Aug. 28, 1909. No. 7513.

The Cooper Gas Engine. Illustrated detailed description. 900 w. *Ir Age*—Oct. 14, 1909. No. 8545.

The Strength of Gas Engine Crank Shafts. Michael Longridge. Abstracted from the annual report for 1908 of the Chief Engr. to the British Engine, Boiler, and Elec. Ins. Co., Ltd. Mathematical. 2000 w. *Mech Engr*—Sept. 10, 1909. No. 7852 A.

See also same title, under **MARINE AND NAVAL ENGINEERING**; Gasoline Engines, under **COMBUSTION MOTORS**; Refrigeration, under **HEATING AND COOLING**; Pumping Engines, under **HYDRAULIC MACHINERY**; Crank Shafts, under **MACHINE ELEMENTS AND DESIGN**; Gas vs. Steam, under **POWER AND TRANSMISSION**; Central Stations and Isolated Plants, under **ELECTRICAL ENGINEERING**. GENERATING STATIONS; Coke-Oven Gas, under **MINING AND METALLURGY**. COAL AND COKE; and Blowing Engines, under **MINING AND METALLURGY**, IRON AND STEEL.

Gas-Engine Testing.

Testing Gas Engines and Motors. E. S. Frash. On the prony brake and indicator tests in internal combustion work. 1200 w. *Power*—Dec. 29, 1908. No. 1317.

See also **Testing Laboratories**, under **MEASUREMENT**.

Gas Metering.

Experiments on a Method of Measuring the Air- or Gas-Supply to Engines and Furnaces. Andrew George Ashcroft. Describes experiments made in connection with a series of tests on internal combustion engines. Ills. 1700 w. *Inst of Civ Engrs*—No. 3778. No. 2798 N.

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Gasoline Engines.

Rating of Petrol Engines. Considers the objects of having a rating rule, and the various suggestions for rating. 4500 w. Engng—June 25, 1909. No. 6298 A.

Proportions of Diameter and Stroke in Petrol Engines. A discussion of what proportions give the lightest engine and the most convenient arrangement of parts. Ills. 2500 w. Engng—Jan. 22, 1909. No. 2218 A.

Formulas and Tables for Horse-Power of Gasoline Engines. Morris A. Hall. With explanatory notes. 600 w. Mach, N Y—April, 1909. No. 3648 C.

The Design of Cams for High-Speed Motors. Considers the type of valve-gear most general on petrol motors. 1500 w. Mech Wld—Nov. 13, 1908. No. 429 A.

A Variable Stroke Petrol Engine. Illustrates and describes a new variable stroke engine and direct drive, stating some of its advantages. 1000 w. Engr, Lond—Oct. 15, 1909. No. 8949 A.

Remodeling Gasoline (Petrol) Engines for Producer Gas. H. F. Smith. Read before the Nat. Gas and Gasoline Eng. Trds. Assn. (Abstract). States briefly the main points to be considered in an engine designed for producer gas, discussing details. 2500 w. Int Marine Engng—Oct., 1909. No. 8323 C.

Foreign Aeronautic Motors. Some of the latest light-weight gasoline engines for flying machines that have been brought out in Europe are illustrated and described. 3000 w. Sci Am Sup—Feb. 13, 1909. Serial. 1st part. No. 2405.

Another British Flight Engine. Illustrated description of G. de Havilland's 45-h. p. model, weighing 250 lbs. complete. 1000 w. Auto Jour—Sept. 25, 1909. No. 8336 A.

Light Explosion Motors for Dirigible Balloons and Aeroplanes (Les Moteurs à Explosion légers pour Dirigeables et Aéroplanes). Ch. Dantin. Discusses the requirements of an aeronautical motor and describes types. Ills. Serial, 1st part. 4000 w. Génie Civil—June 5, 1909. No. 6547 D.

Aeronautical Motors (Motoren für Luftfahrzeuge). E. Rumpler. A discussion of the requirements and descriptions of a large number of types. Ills. Serial. 1st part. 5000 w. Zeitschr d Ver Deutscher Ing—March 20, 1909. No. 4293 D.

(See also same title, under MARINE AND NAVAL ENGINEERING; and Cams, under MACHINE ELEMENTS AND DESIGN.

Gasoline Engine Testing.

Gasoline Engine Testing. James L. Miller. Abstract of paper read before the Glasgow Tech. Col. Sci. Soc. Describes the works testing of finished gasoline engines. 1800 w. Gas Engine—Oct., 1909. No. 8524.

The Testing of Petrol Engines. Jas. L. Miller. Read before the Glasgow Tech. College Sci. Soc. Explains the objects of the test and the method. 2000 w. Mech Engr—June 4, 1909. No. 5523 A.

The Testing of Petrol Engines. Jas. L. Miller. Read before the Glasgow Tech. College Sci. Soc. Explains the objects of the tests and some methods used. 2500 w. Mech Wld—May 7, 1909. No. 4663 A.

Gasoline Turbines.

Test of a Gasoline Turbine (Essai d'une Turbine à Pétrole). Alfred Barbezat. Describes the machine, its theory, the tests and the significance of their results. Ills. 2200 w. Schweiz Bau—Jan. 16, 1909. No. 2690 B.

Gas Power Plants.

Suction Gas Producer Power. L. P. Tolman. Deals with suction gas power plants in single units of 200 h.p. and smaller, and complete plants made up of a number of such units 1000 h.p. or larger. Ills. 4500 w. Cal Jour of Tech—Jan., 1909. No. 2712.

Power Plant Design for Gas Power. H. R. Linn. Thesis for degree of Mech. Eng. at University of Ill., which discusses history, development and application of gas engines for power plants and design of plants. 8500 w. Indus Engng—Oct. 15, 1909. No. 8575 B.

The Reliability of the Producer Gas Plant. Godfrey M. S. Tait. A discussion of recent reliability tests. 900 w. Casier's Mag—Dec., 1908. No. 953 B.

Operation of a Small Producer Gas-Power Plant. C. W. Obert. Plan and description of a notable installation, including a 400-h. p. producer gas plant for the operation of refrigerating and electric machinery. 3500 w. Jour Am Soc of Mech Engrs—May, 1909. No. 4412 F.

Producer Gas Power Observations. T. S. Daniel. Discusses design, operation, and cost of gas producer plant. 2500 w. Minn Engr—March, 1909. No. 4067 C.

Getting the Most Out of Gas Engines. E. G. Tilden. Describes experiments with a small gas engine plant to produce increased economy. Also a heater for exhaust gases and circulating water. Ills. 700 w. Power—June 8, 1909. No. 5327.

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A Small Producer-Gas Power Plant in a Watch Factory. Describes a successful plant in Jersey City, N. J. 2800 w. Eng Rec—April 17, 1909. No. 4012.

Small Isolated Producer-Gas Power Plant. Osborn T. Monnett. Illustrated description of a very efficient installation at Milwaukee. 1500 w. Power—Oct. 26, 1909. No. 8774.

The Gas Power Plant at the Swift Warehouse in New York. Illustrated description. 2200 w. Eng Rec—Jan. 16, 1909. No. 1765.

Good Record by a Suction Producer and Hit-and-Miss Engine. Wesley E. McArdell. Describes experience with a producer plant where the producer paid for itself in a year. 1400 w. Power—June 8, 1909. No. 5325.

The Largest Coke-Oven Gas Engine Plant. J. B. Von Brussel. Illustrates and describes how an up-to-date colliery is able economically to cover all its power requirements. 1000 w. Eng & Min Jour—June 12, 1909. No. 5478.

Utilizing Blast-Furnace Gases at Gary. Describes a plant to be operated by gases formerly considered waste. 3000 w. Eng & Min Jour—Jan. 2, 1909. No. 1441.

The Boston Elevated Railway Company's Recent Gas Engine Experience. H. S. Knowlton. A review of the performance of the gas-engine station at Somerville, Mass., comparing it with the steam plant at East Boston. 2000 w. Eng Rec—March 27, 1909. No. 3541.

A Clean Cut Factory Gas Power Plant. Cecil P. Poole. Illustrated description of a 60-cycle plant operating in parallel, at Swissvale, Penn. 2000 w. Power—Dec. 8, 1908. No. 873.

The New Gas Power Plant of the Union Switch & Signal Company. Illustrated detailed description of the plant at Swissvale, near Pittsburgh, Pa. 2000 w. Eng Rec—Dec. 12, 1908. No. 958.

A Notable Producer Gas Power Station. Cecil P. Poole. Illustrated description of a railway and lighting plant at Charlotte, N. C., in which 60-cycle alternators are driven in parallel by gas engines supplied by bituminous producers. 1500 w. Power—Dec. 22, 1908. No. 1077.

Bituminous Gas-Producer Electrical Generating Plant. Elbert A. Harvey. Illustrated description of the plant of the Garford Company, Elyria, Ohio. 1000 w. Elec Wld—Jan. 2, 1909. No. 1471.

Municipal Producer Gas Plants at Peru, Ind. Osborn Monnett. Illustrated de-

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scription of a plant supplanting a steam-engine plant and showing reduced consumption. 1500 w. Power—March 16, 1909. No. 3186.

Letombe Power Gas Installation of 1000 Indicated Horse-Power Capacity. Illustrated description translated from *Revue Ind.* 3000 w. Mech Engr—Feb. 5, 1909. No. 2478 A.

See also Central Stations, under ELECTRICAL ENGINEERING, GENERATING STATIONS; Rolling Mills, under MINING AND METALLURGY, IRON AND STEEL; and Gas Power, under MINING AND METALLURGY, MINING.

Gas Producers.

Producer Gas. With Special Reference to Suction Gas Producers for Power. Lawrence P. Tolman. Reviews the history and development, efficiency, testing, etc. Ills. 4000 w. Jour Worcester Poly Inst—March, 1909. No. 3447 C.

Producer Gas for Engines. J. Emerson Dowson. Considers the process of making producer gas and some of the chemical reactions involved. Ills. 2500 w. Nature—April 15, 1909. Serial. 1st part. No. 4184 A.

The Suction Gas Producer. T. W. Burt. Explains the theory of producer gas, the general principles to be complied with and the methods in use. Ills. 5000 w. Cassier's Mag—June, 1909. No. 5540 B.

On the Rate of Formation of Carbon Monoxide in Gas Producers. Describes investigations made in the Physical Laboratory of the University of Illinois. Ills. 5500 w. Univ of Ill, Bul. 30—Feb. 1, 1909. No. 5695 N.

The Physical Theory of Coal Carbonization. W. H. Fulweiler. Read before the Am. Gas Inst. Brief review of the development, describing methods of carbonization used, and related matters. 10700 w. Am Gas Lgt Jour—Jan. 4, 1909. Serial. 1st part. No. 1395.

Vital Points in Producer Construction. F. C. Tryon. Criticism and suggestions. 3000 w. Power—Dec. 1, 1908. No. 722.

The Generation of Producer Gas. Oskar Nagel. Detailed discussion of the gasification of different fuels. 2000 w. Elec-Chem & Met Ind—Aug., 1909. No. 6827 C.

The Utilization of Low-Grade Fuels in the United States. Dr. O. K. Zwingenberger. Read before the Am. Inst. of Chem. Engrs. Reviews European practice and discusses especially the proper design of gas-producers for low-grade

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fuels. Ills. 4000 w. Elec-Chem & Met Ind—Aug., 1909. No. 6825 C.

Report of Gas Producer Development Abroad. Discussion at the Washington meeting. 1500 w. Jour Am Soc of Mech Engrs—Sept., 1909. No. 8098 F.

The Suction Gas Producer for Small Power Plants. C. J. Atkinson. Read before the Nat. Gas & Gasoline Eng. Trds. Assn. Describes the process of making the gas, and applications made. 2500 w. Gas Engine—July, 1909. No. 6439.

Gas Producers and Gas Firing. Ernest Schmatolla. Presents the advantages of gas producers in their fuel economy, smoke prevention, etc., illustrating and describing types and explaining their operation. 6000 w. Min Jour—Feb. 6, 1909. No. 2481 A.

The Construction of Gas Producers. Dr. Oskar Nagel. Illustrated detailed descriptions of types. 3000 w. Elec-Chem & Met Ind—Sept., 1909. No. 7594 C.

How to Run a Suction Gas Producer. F. C. Tryon. Discusses the starting and operating of such a plant. 1800 w. Power—Nov. 17, 1908. No. 294.

Experience with Suction Gas Producers. Notes from actual experience in the manufacture and working of suction-gas plants. 2500 w. Engr, Lond—July 23, 1909. Serial, 1st part. No. 6857 A.

Operation of Induced Draft and Suction Producers. Frank P. Peterson. Discusses the danger of explosion, and the use of flame arresters. 2000 w. Power—Jan. 5, 1908. (Special No.) No. 1486 D.

Notes on Anthracite Producer Practice. George C. Stone. An account of experiments made in the effort to improve practice. 1200 w. Jour Ind & Engng Chem—Jan., 1909. No. 2039 E.

Bituminous Producer Plants. Elbert A. Harvey. Abstract of paper, with discussion. 6500 w. Jour Am Soc of Mech Engrs—Jan., 1909. No. 1854 F.

Gas Producer Plant for Bituminous Coal. Illustrates and describes an experimental plant in Gloucester that seems satisfactory. 1200 w. Engr, Lond—Sept. 24, 1909. No. 8369 A.

Recent Producers for Bituminous Coal (Neuere Generatoren für bituminöse Brennstoffe). J. Gwosdz. A number of types are described. Ills. 2200 w. Glück-auf—May 22, 1909. No. 5759 D.

The Westinghouse Double-Zone Bituminous Gas Producer. Illustrated detailed description, with report of tests.

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Gas Producers

3000 w. Ir Trd Rev—June 24, 1909. No. 5884.

The Westinghouse Double-Zone Bituminous Gas Producer. From the report of the Committee on gas engines of the Nat. Elec. Lgt. Assn. Illustrates and describes this type of plant and its operation. 3000 w. Ir Age—June 17, 1909. No. 5565.

Morton's Suction Gas-Producer for Bituminous Fuel. Illustrated description. 1200 w. Engng—June 11, 1909. No. 5659 A.

Suctions Gas Producer for Bituminous Fuel: Morton's Patent. Illustrated description, with report of tests. 1500 w. Col Guard—July 30, 1909. No. 6981 A.

Scoby-Smith's Gas Producer. Illustrated description of a gas producer for use in melting and heating steel. 600 w. Mech Engr—July 30, 1909. No. 6971 A.

The Construction and Management of Gas Producers for Open-hearth Steel Works. C. Canaris. Trans. from *Stahl und Eisen*. Considers the more important points in the construction and management of gas producers, discusses types, and favors the proved types of rotary grate gas producers. 4500 w. Ir & Coal Trds Rev—March 12, 1909. No. 3430 A.

Suction Producer Plants Using Culm as Fuel (Sauggeneratorenanlagen mit Kohlenlöschbetrieb). Herr Diedrich. Illustrates and describes the producers in two plants in Germany operating on culm, fine coal, coke dust, etc. 3000 w. Glasers Ann—March 1, 1909. No. 4275 D.

The Letombe Gas Producers (Les Gazogènes de M. Letombe). M. Brüll. Illustrated detailed description. 1500 w. Bul Soc d'Encour—March, 1909. No. 4217 G.

The Parsy Horizontal Gas Producer (Gazogène à Combustion horizontale pour Fours à Cornues d'Usines à Gaz, Système Parsy). A. Grebel. Describes the producer and its working. Ills. 3000 w. Génie Civil—April 24, 1909. No. 4841 D.

The S. F. H. Gas Producer, Cleaned by Fusion of the Cinder (Note sur le Gazogène S. F. H. a Décrassage par Fusion des Cendres). M. Sepulchre. A brief description, presented by the inventor before the Congress of Applied Chemistry. Ills. 1700 w. Rev de Métal—June, 1909. No. 6511 E + F.

Pyrometers in Gas Producer Operations. R. L. Frink. An account of results obtained by a method of controlling the fires by means of temperature indication, and by the use of a properly installed pyro-

MECHANICAL ENGINEERING

Gas Turbines

meter. 2500 w. *Pro Age*—Feb. 15, 1909. No. 2455.

A Process of Making Gas from Oil. Walter C. Willard. Illustrates and describes a method and apparatus which utilizes residuum oil, reporting tests. 2500 w. *Ir Trd Rev*—Feb. 11, 1909. No. 2441.

Col. J. J. Astor's Vibratory Disintegrator. Illustrated description of an ingenious device which manufactures producer gas from peat. 900 w. *Sci Am*—May 22, 1909. No. 4902.

Gas Turbines.

The Pelterie Explosion Turbine. A brief résumé of a new system patented by the inventor, M. Esnault-Pelterie. 800 w. *Auto Jour*—April 24, 1909. No. 4444 A.

Gas Turbine Tests (Versuche an einer Petroleumturbine). Alfred Barbezat. Describes progress to date. 2500 w. *Zeitschr f d Gesamte Turbinenwesen*—May 19, 1909. No. 5780 D.

A Practical Study of the Gas Turbine (Etude pratique de la Turbine à Combustion). Charles Lemale. A discussion of recent investigations and progress. Ills. 2700 w. *Tech Mod*—Sept., 1909. No. 8618 D.

See also Gas Engines, under COMBUSTION MOTORS; and Turbines, under STEAM ENGINEERING.

Ignition.

Ignition. J. A. Williams. Read before the Nat. Gas & Gasoline Eng. Trds. Assn. Also discussion. Discusses the make and break and jump spark systems. 7000 w. *Gas Engine*—March, 1909. No. 3190.

The Science of a Jump Spark Coil. J. A. Williams. Read before the Gas & Gasoline Eng. Trds. Assn. Analyzes the coil, explaining the function of each part, and considers the action. 3300 w. *Gas Engine*—July, 1909. No. 6440.

The Science of the Jump Spark Coil. J. A. Williams. Read before the Gas Eng. Trds. Assn. Describes the various parts of the spark coil and their functions, and how they act. 3000 w. *Naut Gaz*—July 8, 1909. No. 6231.

The Lodge "B" Spark High-Tension Ignition. Describes a new type brought out by Sir Oliver Lodge. Ills. 1000 w. *Sci Am Sup*—Dec. 5, 1908. No. 819.

Getting Acquainted with the Jump-Spark. Herbert L. Towle. Diagrams and explanatory notes. 3500 w. *Rudder*—Jan., 1909. No. 1502 C.

Oil Engines.

Oil Engines. W. A. Tookey. Abstract of a paper read before the Manchester

COMBUSTION MOTORS

Power

Assn. of Engrs. Considers the differences in the methods of treatment adopted by makers, and the salient features. Ills. 3000 w. *Mech Engr*—Nov. 20, 1908. No. 730 A.

Crude Oil Engines for Land and Marine Purposes. Illustrated description of a new type of crude oil engine, built in Stamford, Eng. 1700 w. *Engng*—June 4, 1909. No. 5530 A.

Combined Oil Engine and Dynamo. Brief illustrated description of small combined lighting sets. 500 w. *Engr, Lond*—April 2, 1909. No. 3912 A.

Junkers' Two-Cycle Oil Engine. Illustrated description of the engine and its operation. 800 w. *Mech Engr*—Feb. 26, 1909. No. 3050 A.

Crude-Oil Engines at the Jubilee Exhibition in Prague. Describes exhibits. 4700 w. *Engng*—Nov. 13, 1908. No. 442 A.

The Employment of Hydrocarbon Extracts from Petroleum, Bituminous Shales and Coal in Combustion Motors (Emploi des Hydrocarbures extraits des Pétroles des Schistes et de la Houille dans les Moteurs à Explosion). A. Grebel. Discusses the advantages of liquid fuels, resources of France in mineral oils, etc. 4400 w. *Génie Civil*—Dec. 26, 1908. No. 1932 D.

Tests of a Diesel Motor (Versuche an einem Dieselmotor). Dr. Karl Kobes. An elaborate mathematical discussion of a number of tests of a 70 horse-power oil motor belted to a dynamo. Ills. Serial/ 1st part. 3500 w. *Zeitschr d Oest Ing u Arch Ver*—Nov. 20, 1908. No. 1180 D.

Development and Extension of the Use of Diesel Motors in Russia and their Application to Ship Propulsion (Die Entwicklung und Verbreitung des Dieselmotors in Russland und seine Verwendung als Schiffsmotor). R. Murauer. Describes some of the latest designs. Ills. Serial, 1st part. 3000 w. *Zeitschr d Ver Deutscher Ing*—July 24, 1909. No. 7476 D.

Fuel Consumption, Efficiency and Economy Tests on Sulzer-Diesel Motors (Provè di Consumo, Rendimento e Costo eseguite su Motori Sulzer-Diesel). Emilio Gerli. Reports some recent tests in a generating station. Ills. 2700 w. *Monit Tech*—Sept. 30, 1909. No. 8640 D.

See also Gas Engine Design, under COMBUSTION MOTOR; Pumping, under HYDRAULIC MACHINERY; and Oil Engines, under MARINE AND NAVAL ENGINEERING.

Power.

A priori Determination of the Power of an Explosion Motor (Détermination "à priori" de la Puissance des Moteurs

MECHANICAL ENGINEERING

Producer Gas

à Explosion). E. Girardault. A critical mathematical discussion of various formulae proposed. Ills. 2400 w. Génie Civil—Feb. 20, 1909. No. 3345 D.

Producer Gas.

The Use of Producer Gas in Chemical and Metallurgical Industries. Dr. Oskar Nagel. Illustrated description of various applications. 800 w. Elec-Chem & Met Ind—April, 1909. No. 3661 C.

Thermodynamics.

Internal-Combustion Engines (Ueber Verbrennungskraftmaschinen). Alfred

HEATING AND COOLING

Büchi. Begins an elaborate discussion of the thermodynamics of gas, gasoline and oil engines. Ills. Serial, 1st part. 1700 w. Zeitschr f d Gesamte Turbinenwesen—July 20, 1909. No. 7290 D.

Valve Gears.

Krupp's Valve Gear for Internal-Combustion Engines. Drawings and description of the valve-gear and its working. 1800 w. Mech Engr—Nov. 6, 1908. No. 306 A.

See also Gasoline Engines, under COMBUSTION MOTORS.

Central Plants

HEATING AND COOLING

Air Filtration.

The Combemale System of Air Filtration (Le Filtrage de l'Air, Système Combemale). J. J. Pillet. Illustrated description. 1800 w. Bul Soc d'Encour—Dec., 1908. No. 2621 G.

Air Humidifying.

See Hygrometric Charts, and Ventilation, under HEATING AND COOLING.

Air Washing.

An Investigation of Air Washing. Preliminary report of the Committee of the Am. Soc. of Heat. & Vent. Engrs. on types of air washers and their effect. 800 w. Heat & Vent Mag—Aug 1909. No. 7097.

Boilers.

See Boiler Design, and Boiler Rating, under STEAM ENGINEERING.

Car Barns.

Heating a Trolley Car Barn. J. Irving Brewer. Shows the application of principles recognized as good heating practice, to the design of the heating system for a trolley car barn suitable for inspecting cars and making light repairs. Plan. 2000 w. Eng News—April 29, 1909. No. 4359.

Central Plants.

Facts About City or District Steam. John V. Stout. Remarks on its advantages and disadvantages when used for heating buildings. 1400 w. Heat & Vent Mag—July, 1909. No. 6472.

Engineering Aspects of District Steam Heating. H. C. Eddy. Considers the factors involved in the profitable development of district heating. 2000 w. Elec Wld—Oct. 7, 1909. No. 8393.

Central Heating Plants (Fernheizwerke). Max Hottinger. Discusses the various systems and the design of plants. Ills. Serial. 1st part. 1800 w. Schweiz Bau—Oct. 3, 1908. No. 560 B.

The Operation of Central Heating Plants in Office Buildings (Mitteilungen über den Betrieb von Zentralheizungen in Amtsgebäuden). Leopold Nowotny. A practical discussion of possible difficulties. Ills. 2000 w. Oest Wochenschr f d Oeffent Baudienst—Jan. 2, 1909. No. 2815 D.

Central Hot-Water Heating Systems (Fernwarmwasserheizungen). O. Krell. Examines the possibility of installing a system similar to that of the New York Steam Company in Nürnberg, Germany. Ills. 2800 w. Gesundheits-Ing—April 24, 1909. No. 4889 D.

The Problems of the Municipal Heating Engineer (Ueber die Aufgaben der Städt Heizungsingenieure). Herr Arnoldt. Discusses principally the letting of contracts for the installation of heating plants, methods of testing, etc. 8300 w. Gesundheits Ing—June 26, 1909. No. 6704 D.

London Municipal Heat Supply. Alfred E. Wheeler. Discusses the advantages of central station heat generation, especially its relation to the prevention of smoke. 3000 w. Archt, Lond. June 4, 1909. Serial. 1st part. No. 5513 A.

Heating Buildings in Groups by Contract in Chicago. Illustrated description of the methods of the Illinois Maintenance Co. 2000 w. Elec Wld—Oct. 7, 1909. No. 8392.

Central Heating Plant for Lebanon, Ind. Byron T. Gifford. Illustrated description

MECHANICAL ENGINEERING

Cooling Towers

of a central hot-water system. 1200 w. Power—March 2, 1909. No. 2906.

Central Heating and Lighting Plant for the United States Military Academy. Henry C. Meyer, Jr. Plan and illustrated description of the plant at West Point to serve a group of buildings. 4500 w. Eng Rec—May 1, 1909. Serial, 1st part. No. 4392.

See also Hot-Water Heating, under HEATING AND COOLING.

Cooling Towers.

Cooling Towers. H. F. Blake. Classifies and describes types, with remarks on their use and efficiency. 2000 w. Power—Feb. 9, 1909. No. 2380.

Cooling-Tower Practice. J. H. Hart. Information in regard to both the open and closed types, their efficiency, etc. 2000 w. Elec Wld—March 4, 1909. No. 2992.

Cooling Towers. Samuel K. Patteson. Illustrates and describes methods of conserving water for condensing purposes. 2500 w. Cassier's Mag—April, 1909. No. 3636 B.

Design and Operation of Cooling Towers. M. R. Bump. Read before the Nat. Elec. Lgt. Assn. Compares the relative merits of natural and forced draft types. 3000 w. Power—June 22, 1909. No. 5813.

Cooling Towers. John Roberts. Deals with cooling water for condensers, giving an illustrated description of a new form of tower devised by the writer. Also discussion. 9500 w. Jour S African Assn of Engrs—Sept., 1909. No. 8823 F.

Cooling Towers (Ueber Rückkühlwerke). E. Arnold. A discussion of cooling tower practice and design with results of tests on a number of towers. Ills. 4500 w. Stahl u Eisen—March 3, 1909. No. 4249 D.

See also Condensers, under STEAM ENGINEERING.

Drying Plants.

Calculation of Air and Heat Requirements of Drying Plants (Die Berechnung des Luft- und Wärmebedarfs für Trockenanlagen in der Praxis). W. Franken. Gives a number of very elaborate tables. 8700 w. Gesundheits-Ing—Oct. 24, 1908. No. 588 D.

Electric Heating

The Relative Advantages of Coal, Gas and Electric Heating (Güterverhältnis zwischen Kohlen-, Gas- und elektrischer Heizung). M. Grellert. A reply to E. R. Ritter's article on electric heating, showing the comparative cheapness of gas.

HEATING AND COOLING

2800 w. Gesundheits-Ing—Dec. 12, 1908. No. 1967 D.

See also Heating, under ELLECTRICAL ENGINEERING, POWER APPLICATIONS.

Errors.

Experiences in Heating (Erfahrungen in Heizungsfach). Otto Ginsberg. Discusses a number of common errors in heating practice. Ills. Serial, 1st part. 5000 w. Gesundheits-Ing—June 19, 1909. No. 6703 D.

Exhaust Gas Heating.

Heating by the Waste Gases from Oil Engines (Verwendung der Dieselmotorenabwärme zu Heiz- und Warmwasserbereitungszwecken). M. Hottinger. A report of tests. 2300 w. Gesundheits-Ing—June 26, 1909. No. 6705 D.

Experimental Apparatus.

Glass Experimental Apparatus (Eine Glasheizung für Versuchszwecke). Max Hottinger. Describes apparatus devised for studying hot-water heating phenomena, with results of tests. Ills. 4000 w. Gesundheits-Ing—Feb. 13, 1909. No. 3389 D.

Fan Blast.

See Hot-Air Heating, under HEATING AND COOLING.

Fans.

Electrically-Driven Fans. George W. Baird. Gives tabulated report of tests and general information. 1500 w. Jour Am Soc of Nav Engrs—Aug., 1909. No. 8090 H.

Electric Fans: Their Use and Abuse. Results of investigations into the action of small ventilating fans on the purity of the atmosphere. 1500 w. Elec Engr, Lond—Oct. 1, 1909. No. 8479 A.

Experiments on the Efficiency of Ceiling Fan Blades. L. Murphy. Describes the investigations and gives the results. 1500 w. Elec Rev, Lond—April 2, 1909. No. 3895 A.

Capell's Centrifugal Fan. Illustrates and describes recent improvements made in this fan. 1000 w. Mech Engr—Sept. 17, 1909. No. 8118 A.

Notes on Fan Construction (Beispiele aus dem Gebiete des Ventilatorenbaues). Th. v. Bavier. Describes various types of fans and their use. Ills. 3500 w. Zeitschr d Ver Deutscher Ing—May 29, 1909. No. 5968 D.

Heat Losses

Evolution in Heating. J. M. W. Kitchen. Introductory to a series of articles

MECHANICAL ENGINEERING

Gas Heating

illustrating the theories on which the writer bases his arguments in regard to heat losses. Ills. 2000 w. *Heat & Vent Mag*—Nov., 1908. Serial. 1st part. No. 903.

See also Wind Effects, under HEATING AND COOLING.

Gas Heating.

The Use of Coal Gas in Baking Ovens. Information on various applications of gas firing. 2000 w. *Prac Engr*—Nov. 6, 1908. No. 301 A.

Modern Methods of Heating. H. R. Basford. Read before the Pacific Coast Gas Assn. Gives a report of automatic gas water heating devices and their performances. Discussion. 4400 w. *Pro Age*—Nov. 16, 1908. No. 290.

Heating Systems.

A Few Principles for Heating Buildings. R. W. Kings. Considers the main points to be borne in mind by engineers. 6000 w. *Con Rec*—May 12, 1909. No. 4675.

Heat Transmission.

Heat Transmission Coefficients (Beitrag zur Kenntnis des Wärmetransmissionskoeffizienten). Ludwig Dietz. Gives the results of a long series of tests. Ills. 3800 w. *Gesundheits-Ing*—March 20, 1909. No. 4278 D.

Hospitals.

Some Methods of Heating Adopted in Hospitals and Asylums Recently Built. Ernest Richard Dolby. Illustrates and describes heating and hot-water service systems designed for conditions in England. Discussion. 22500 w. *Inst of Civ Engrs*—No. 3687. No. 3209 N.

Warming and Ventilating with Special Reference to Hospital Buildings. D. D. Kimball. Reviews the history and development of the principles of ventilation, explaining methods of warming and ventilating hospitals. 3500 w. *Br Build*—May, 1909. Serial. 1st part. No. 5155 D.

Hot-Air Heating.

Theoretical Considerations in the Design of Residence Furnace Heating Systems. James D. Hoffman. Mentions the advantages and disadvantages of such a system, and considers points to be calculated in the design. 2500 w. *Met Work*—Dec. 26, 1908. No. 1258.

A Defense of the Warm Air Furnace. Charles S. Prizer. Abstract of presidential address at meeting of the Federal

HEATING AND COOLING

Hot-Water Heating

Furnace League. Answers the usual objections made to this system. 2000 w. *Heat & Vent Mag*—Sept., 1909. No. 7883.

Report of the Committee on Fan-Blast Heating. Also tables and related matter. 3000 w. *Am Soc Heat & Vent Engrs*—July 15, 1909. No. 6465 N.

Fan-Blast Heating Data. Supplementary report of committee, presented to the Am. Soc. of Heat. & Vent. Engrs. 2000 w. *Met Work*—July 31, 1909. No. 6785.

Recent Investigations in Hot-Air Heating and Ventilating (Sopra recenti Studi di Ventilazione e Riscaldamento ad Aria calda). Luigi Boldrocchi. Illustrates and describes recent systems and appliances. Serial. 1st part. 1800 w. *Industria*—Nov. 15, 1908. No. 1133 D.

Design of Furnace Heating Systems, with an Application to a Ten-Room Residence. J. D. Hoffman. Detailed discussion of necessary calculations. 4500 w. *Heat & Vent Mag*—March, 1909. Serial. 1st part. No. 3453.

An Unusual Residence Furnace Heating Plant. Describes a trunk main system with arrangements for return air circulation which is effected by open fireplaces. Ills. 3000 w. *Met Work*—May 8, 1909. No. 4556.

A Combination Heating System in Malone, N. Y. Plans and description of a satisfactory system in which the main parts of the house are heated by warm air, and the more exposed rooms are warmed by hot water radiation. 2000 w. *Met Work*—Aug. 14, 1909. No. 7063.

A Fan System of Church Heating in Solvay, N. Y. R. H. Bradley. Describes a fan pressure system of warm-air heating which is claimed to possess advantages over an indirect steam or hot-water gravity apparatus. Ills. 560 w. *Met Work*—June 5, 1909. No. 5362.

Heating a Montreal Church. Describes an indirect gravity system supplemented by a fan. Ills. 2500 w. *Met Work*—Jan. 16, 1909. No. 1755.

A Mechanical Furnace Heating System. Plans and description of the heating and ventilating plant for the High School building at Barnesville, Ohio. 4500 w. *Met Work*—April 10, 1909. No. 3844.

See also Ventilation, under HEATING AND COOLING; and Shop Heating, under MACHINE WORKS AND FOUNDRIES.

Hot-Water Heating.

Design of a Central Heating System with Forced Circulation of Hot Water. Joseph T. Maguire. Discusses the design

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Hot-Water Heating

HEATING AND COOLING

Liquid Air

of a forced-circulation, central, hot-water heating system. 3000 w. Eng News—Sept. 2, 1909. No. 7537.

The Determination of the Sizes of Pipes for Hot Water Heating. F. E. Giesecke. Explains a method of designing a pipe system to insure satisfactory results. 1800 w. Dom Engng—May 29, 1909. Serial. 1st part. No. 5151.

A New Rapid Circulation Hot-Water Heating System. Describes the Turul system and its operation. Ills. 2500 w. Heat & Vent Mag—Aug., 1909. No. 7098.

A Large Residence Hot Water Heating System. Plans and description of an interesting system installed at Bernardsville, N. J. 800 w. Met Work—Jan. 2, 1909. No. 1398.

Domestic and Circulating Hot-Water Boilers. Remarks on their general management and means of preventing explosions, taken from W. H. Fowler's work on steam boilers. Ills. 2000 w. Mech Engr—Jan. 8, 1909. No. 1810 A.

The Design of Low-Pressure Hot-Water Heating Systems (Calcul des Installations de Chauffage par l'Eau Chaude à Basse Pression). E. Mathieu. A mathematical discussion. Ills. Serial. 1st part. 1000 w. La Métal—Oct. 14, 1908. No. 531 D.

Design of Hot-Water Heating Systems with Reference to Heat Loss in Pipe Lines (Die Berechnung der Warmwasserheizung unter Berücksichtigung der Wärmeverluste der Rohrleitungen). Dr. Rietschel. Discusses both single and double pipe systems. Ills. 10000 w. Gesundheits-Ing—Dec. 19, 1908. No. 1969 D.

A Comparison Between the Single- and Double-Pipe Hot Water Heating Systems (Ein Vergleich zwischen dem Einrohr- und dem Zweirohrsystem der Warmwasserheizung). H. Roose. Supports the single-pipe system. 2000 w. Gesundheits-Ing—Dec. 5, 1908. No. 1965 D.

Heating by Hot Water Under Pressure (Ueber Druckwasserheizung). Anton Gramberg. An exhaustive discussion of this new method. Ills. Serial. 1st part. 9300 w. Gesundheits-Ing—Dec. 26, 1908. No. 1970 D.

Distant Hot-Water Heating (Fernwarmwasserheizung). Dr. Rietschel. Discusses central plants and distribution systems. Ills. 6600 w. Gesundheits-Ing—Dec. 19, 1908. No. 1968 D.

The Calculation of Pipe-Lines for Hot-Water-Heating (Die Berechnung der Rohrleitungen bei Warmwasserheizungen). M. Haller. A reply to Herr

Rietschel. Ills. 3000 w. Gesundheits-Ing—May 8, 1909. No. 5797 D.

Local Regulation of Hot-Water Heating (Die örtliche Regelung der Warmwasserheizung). Anton Gramberg. Mathematical discussion. Ills. Serial. 1st part. 6000 w. Gesundheits-Ing—Feb. 6, 1909. No. 3388 D.

Accelerated Hot Water Heating Systems. Prof. Ed. Meier. Translation of a paper read before the Vienna Congress. Ills. 2500 w. Met Work—May 29, 1909. Serial. 1st part. No. 5153.

Rapid-Circulation Hot-Water Heating (Turul Schnellumlauflheizung). E. Segesvary. Discusses the advantages of rapid circulation. Ills. 2200 w. Gesundheits-Ing—June 5, 1909. No. 6702 D.

Calculation of Pipe Sizes in Gravity Hot-Water Heating (Berechnung der Rohrweiten bei Schwerkraftwarmwasserheizungen). H. Recknagel. An elaborate discussion, with many tabular data. Ills. Serial. 1st part. 9000 w. Gesundheits-Ing—Sept. 4, 1909. No. 8685 D.

See also Central Plants, Experimental Apparatus, Hot-Air Heating, and Piping, under HEATING AND COOLING; and Boiler Rating, under STEAM ENGINEERING.

Humidity.

The Humidity of the Air and Its Determination. M. F. Thomas. Deals with methods and data for determining the moisture content. Plate. 1600 w. Met Work. Aug. 21, 1909. No. 7175.

Hygrometric Charts.

Humidity and Drying Calculations. Gives two useful hygrometric charts, illustrating their use by examples. 2200 w. Heat & Vent Mag—Oct., 1909. No. 8757.

Indirect Heating.

A Rational Formula Covering the Performance of Indirect Heating Surface. Perry West. Part of a discussion before the Am. Soc. of Heat. & Vent. Engrs. Explains the theory on which the formula is based. 1300 w. Heat & Vent Mag—March, 1909. No. 3451.

Liquid Air.

The Liquefaction of Gases and Commercial Production of Oxygen. Cecil Lightfoot. Illustrates and describes machines for the production of the lowest temperatures for the liquefaction of gases and the chemical separation of gaseous mixtures. 2000 w. Elec Jour—Sept., 1909. No. 7571.

Liquid Air and the Properties of Bodies at Low Temperatures (El Aire liquido y las Propiedades de los Cuerpos á bajas

MECHANICAL ENGINEERING

Ozone Ventilation

Temperaturas). Horacio Damianovich. An exhaustive study of the production, properties and uses of liquid air and its services in scientific investigation. Ills. 14000 w. *Anales d l Soc Cien Argentina*—Feb., 1909. No. 7252 E + F.

Ozone Ventilation.

See Ventilation, under HEATING AND COOLING.

Pipe Bending.

How to Make Hardwood Forms for Bending Iron Pipe Cold. Illustrates and describes types and their making. 1200 w. *Dom Engng*—Nov. 7, 1908. No. 159.

Pipe Corrosion.

Relative Corrosion of Wrought Iron and Steel Pipes. Report of tests made by the Committee appointed by the Am. Soc. of Heat. & Vent. Engrs. 1500 w. *Heat & Vent Mag*—Jan., 1909. No. 1887.

Electrolysis of Iron Pipe. F. P. Siebel. Considers particularly the pitting of iron pipe, its causes and possible prevention. Ills. 3000 w. *Ice & Refrig*—Oct., 1909. No. 8316 C.

Corrosion vs. So-Called Corrosion. W. A. Bradford. The effect of water and other destructive agents on various kinds of pipe. 2500 w. *Met Work*—Oct. 2, 1909. No. 8244.

Pipe Radiation.

Calculations for Heat Losses from Pipes. William M. Grosvenor. Gives curve sheet for simplifying calculations, with explanation. Chart. Presented at meeting of Am. Soc. of Chem. Engrs. 1000 w. *Heat & Vent Mag*—July, 1909. No. 6471.

Piping.

Cast Iron Pipe and Fittings—Their Defects. Charles R. Schmidt. Discusses the subject of house drainage, soil pipes, and fittings, etc. Ills. 3500 w. *Dom Engng*—Feb. 20, 1909. No. 2572.

Size of Pipe Mains for Hot Water Heating. Charles L. Hubbard. Gives curves for determining sizes, explaining their use. 700 w. *Mach, N Y*—Sept., 1909. No. 7504 C.

See also Shafting, under POWER AND TRANSMISSION.

Plumbing.

Plumbing Plans and Specifications. O. B. Craig. Presents the advantages of proper plans and specifications. Drawings. 2000 w. *Met Work*—May 8, 1909. No. 4557.

Some Anomalies in Modern Plumbing Regulations. J. Pickering Putnam. A

HEATING AND COOLING

Refrigeration

critical review of present plumbing conditions, with general discussion. Ills. 10000 w. *Jour Assn of Engng Socs*—April, 1909. No. 5839 C.

Plumbing in the Lackawanna Railroad Station at Scranton, Pa. Illustrated description of the Durham system of drainage used and unusual features of the water installation. 1800 w. *Met Work*—May 22, 1909. No. 4914.

Prisons.

A New Method of Heating and Ventilating Prisons. John G. Eadie. Brief illustrated description of the method used at the new Riker's Island penitentiary. 800 w. *Heat & Vent Mag*—June, 1909. No. 5555.

Radiators.

The Effect of Painting Radiating Surfaces. John R. Allen. Describes experiments conducted at the Experimental Laboratory of the University of Michigan. 1200 w. *Am Soc of Heat & Vent Engrs*—July 15, 1909. No. 6470 N.

Indirect Radiators. Presents the advantages of this method of heating. Ills. 1000 w. *Dom Engng*—Sept. 11, 1909. No. 7709.

Refrigeration.

Artificial Refrigeration. James T. Ludlow. A non-technical description of the anhydrous ammonia compression system. Ills. 4000 w. *Cal Jour of Tech*—April, 1909. No. 4760.

The First International Congress of the Cold (Le premier Congrès international du Froid). L. Marchis. A review of the composition of the congress. 8500 w. *Rev Gen des Sci*—March 15, 1909. No. 4223 D.

Efficiency of Refrigerating Machines. Dr. J. E. Siebel. Considers the results of tests made by Prof. Schroeter, in Munich. 2500 w. *Ice & Refrig*—Oct., 1909. Serial. 1st part. No. 8315 C.

The Molecular Kinetics of Solids, Liquids and Vapors. Dr. J. E. Siebel. A study of the thermo-dynamics of vapors from the kinetics of solids and liquids. 3000 w. *Ice & Refrig*—Sept., 1909. No. 7582 C.

The Refrigerating Machine and the Gas Engine. Joseph H. Hart. Analogy between the ammonia absorption machine and the internal combustion motor. 2500 w. *Cassier's Mag*—Dec., 1908. No. 949 B.

Single and Double-Acting Ammonia Compressors. Thomas Baker. Brief discussion of the comparative advantages. 900 w. *Ohio Soc of Mech, Elec, & Steam Engrs*, No. 143—Nov., 1908. No. 906 N.

MECHANICAL ENGINEERING

Refrigeration

Performance of Ammonia Compression Machines. Charles Edward Lucke. Read before the Am. Soc. of Refrig. Engrs. An illustrated article reporting tests, giving results, and describing methods. Also reply by Thomas Shipley. 16800 w. Cold Storage & Ice—Dec., 1908. No. 991 C.

Standard Method of Testing Refrigerating Machines. D. S. Jacobus. Read before the Am. Soc. of Refrig. Engrs. Reviews the work in this field by the A.S. M.E. and states points that should be considered. 2000 w. Cold Storage & Ice—Dec., 1908. No. 989 C.

The Compression Refrigerating System. F. E. Matthews. An explanation. 2500 w. Power—Jan. 5, 1909. (Special No.) No. 1487 D.

Refrigerating Machines, Compression, Absorption. Gardner T. Voorhees. Comparison of capacities and economies of compression and absorption systems and of the combined system. 3000 w. Ice & Refrig—Feb., 1909. No. 2289 C.

Wet versus Dry Compression. Joseph H. Hart. Explains the meaning of the terms and the factors that determine the efficiency of the two types. 2500 w. Power—March 9, 1909. No. 3041.

A New Compression Refrigerating Machine (Een nieuwe Constructie van Compressie-Koelmachines en eenige toepassingen der kunstmatige koude). J. F. H. Koopman. Refers particularly to the Audiffren machine. Ills. 6000 w. De Ingenieur—April 3, 1909. No. 5080 D.

Compression and Absorption Systems. Their defence by rival manufacturers. Gives the papers of Thomas Shipley and of Heywood Cochran, presented at the Chicago meeting of the Illinois Ice Dealers. 10500 w. Ice & Cold Storage—June, 1909. No. 5464 A.

The Renaissance of the Absorption Machine. Jos. H. Hart. Presents some of its advantages in application and operation. 3500 w. Engineering Magazine—May, 1909. No. 4343 B.

Refrigerating Machine Operation. Especially discusses the details of the improved absorption machines. 2500 w. Prac Engr—April 9, 1909. No. 3993 A.

The Absorption Refrigerating Machine. W. E. Crane. Explains the different parts and their functions and gives advice as to care and operation. 5500 w. Power—June 29, 1909. No. 6022.

Electricity in Refrigeration. R. Louis Lloyd. Describes electrical refrigerating machines in operation in Philadelphia, giving costs. Ills. 4000 w. Jour Fr Inst—Dec., 1908. No. 970 D.

HEATING AND COOLING

Refrigeration

Ethyl Chloride Refrigeration. C. C. Palmer. Read before the Am. Soc. of Refrig. Engrs. Gives results of experiences with ethyl chloride as a refrigerating agent. 2000 w. Cold Storage & Ice—Dec., 1908. No. 987 C.

The Use of Indicators in Refrigeration. Samuel K. Patteson. Discusses the limitations of the diagram in this work, its meaning in compression, and its value, especially in valve setting. 3000 w. Power—April 20, 1909. No. 4050.

Practical Hints. William Westerfield. Suggestions on the application of the indicator to ammonia compressors. 2500 w. Ice & Refrig—Jan., 1909. No. 1456 C.

Humidity and a Cold Storage Evaporimeter. Description of instrument invented by Milo M. Hastings, U. S. Dept. of Agriculture, to determine humidity available for use in the cold storage of fruits. Ill. 3000 w. Cold Stor & Ice—Oct., 1909. No. 8573 C.

The Capacity of Refrigerating Machines. F. E. Matthews. Explains methods of determination, illustrating by example. 3000 w. Power—July 6, 1909. No. 6202.

Modern Commercial Uses of Refrigeration. An illustrated article presenting the benefits from the application of refrigeration in the meat industry. 3500 w. Ice & Cold Storage—Aug., 1909. Serial, 1st part. No. 7064 A.

Refrigeration Installation and Narrow Limits of Temperature. Editorial on the advance made in this field, especially as applied to ships' cargoes of perishable materials. 1500 w. Engng—July 30, 1909. No. 6987 A.

Federal Regulation System of Ice Making. Illustrated description of the construction and operation of the first ice-making plant on this system in America, located at Newark, N. J. 2000 w. Ice & Refrig—Aug., 1909. No. 6879 C.

A Test of the Improved Reynolds Dense-Air Ice Machine, with Observations on Refrigeration on Board Naval Vessels. William Strother Smith. Describes the machine and reports test. Ills. 1500 w. Jour Am Soc of Nav Engrs—Aug., 1909. No. 8093 H.

Calcium Chloride versus Salt. L. E. Diamond. Read at the Indiana Ice Mfrs. Con. Discusses their value and economy as refrigerating agents. 3000 w. Ice & Refrig—March, 1909. No. 3023 C.

The Problem of the Small Refrigerating Machine. Sterling H. Bunnell. Discusses practical conditions attending re-

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Refrigeration

frigeration on a small scale. 2000 w. Cassier's Mag—March, 1909. No. 2922 B.

Refrigeration in Fruit Handling. G Harold Powell. Extracts from a paper presented at International Congress of Refrigerating Industries at Paris. Describes American methods, construction of cars, etc. 3100 w. Ice & Refrig—June, 1909. No. 5446 C.

A Modern Poultry and Egg House. Describes an up-to-date poultry plant at Atchison, Kan. Ills. 3500 w. Ice & Refrig—June, 1909. No. 5443 C.

A Modern Ice Plant in Chicago. Carl Heim. Illustrated description of the model Edgewater plant of the Knickerbocker Co., with cost data and other plant records. 4000 w. Power—Oct. 26, 1909. No. 8773.

Refrigeration in the Hotel Anthony. Describes modern hotel plant with steel glass refrigerators, and a 20-ton ice plant at Fort Wayne, Ind. Ills. 1950 w. Ice & Refrig—June, 1909. No. 5445 C.

Reinforced Concrete Freezing Tanks. William M. Torrance. Read before the Am. Soc. of Refrig. Engrs. Describes the construction and gives the author's experience. Ills. 1500 w. Cold Storage & Ice—Dec., 1908. No. 990 C.

Waterproofing in Refrigerating Work. Edward W. De Knight. Read before the Am. Soc. of Refrig. Engrs. Discusses the rigid method of treatment and the elastic or membrane method. 5500 w. Cold Storage & Ice—Dec., 1908. No. 988 C.

Air Cooling by Refrigeration. W. W. Macon. Discusses how to determine the requirements of refrigerating apparatus needed. 6500 w. Heat & Vent Mag—Jan., 1909. No. 1888.

Air Cooling by Refrigeration. W. W. Macon. Read before the Am. Soc. of Heat. & Vent. Engrs. Discusses the determining requirements of refrigerating apparatus, giving charts for facilitating calculations. 6000 w. Ice & Refrig—July, 1909. No. 6191 C.

The Uses of Mechanical Refrigeration in Metallurgical Practice. Jos. H. Hart. Discusses its value in increasing furnace output and condensing by-products. 2000 w. Engineering Magazine—Feb., 1909. No. 2157 B.

See also Air Compression, and Gas Compression, under POWER AND TRANSMISSION; Reinforced Concrete, under CIVIL ENGINEERING, CONSTRUCTION; Hospital Ships, and Refrigeration, under MARINE AND NAVAL ENGINEERING. Dry-Air Blast, under MINING AND METALLURGY, IRON AND STEEL;

HEATING AND COOLING

Steam Heating

and Refrigeration, under RAILWAY ENGINEERING, MOTIVE POWER AND EQUIPMENT.

School Buildings.

Safeguarding Our Profession. William M. Mackay. Remarks on faulty designs, especially considering school heating and ventilating plants. 2000 w. Am Soc of Heat & Vent Engrs—July 15, 1909. No. 6469 N.

Steam Heating.

Steam Heating in Connection with Central Stations. Abstract of a paper presented at the Penn. Elec. Assn. convention, discussing district heating from electrical plants. 1500 w. Elec Wld—Oct. 7, 1909. No. 8394.

Heating and Ventilating a Banking Building. Charles L. Hubbard. Drawings and descriptions of practically separate systems. 2000 w. Met Work—April 17, 1909. No. 3984.

Installing Heating Systems in Close Quarters. Illustrates and describes the installations at the Importers' and Traders' National Bank, and at the New York Law School, in New York City. 2000 w. Heat & Vent Mag—Dec., 1908. No. 1325.

Heating and Ventilation of the Hotel Plaza, New York; Part I. An 18-story hotel of 800 guest rooms, having one of the finest mechanical equipments ever installed. Plans and description. 5500 w. Eng Rec—March 13, 1909. Serial. 1st part. No. 3113.

Heating and Ventilation of the Union Terminal Station at Washington, D. C. Illustrated description of the heating and ventilating facilities for the head-house. 3500 w. Eng Rec—Jan. 2, 1909. No. 1426.

Heating and Ventilation in the Ford Building, Detroit. An 18-story steel cage building, receiving its steam, electric, compressed air and refrigerating service from an outside source is described. Plan of arrangement is given. 1800 w. Eng Rec—Oct. 16, 1909. No. 8598.

Heating and Ventilating System, Finney Chapel, Oberlin College, Oberlin, Ohio. B. S. Harrison. Sketches and description of the system adopted. 900 w. Am Soc of Heat & Vent Engrs—July 15, 1909. No. 6468 N.

Heating and Ventilating a Six-Room School Building. Charles L. Hubbard. Describes a simple gravity system of indirect heating for class rooms, and direct radiation in corridors and coat rooms. Ills. 2500 w. Met Work—Oct. 23, 1909. No. 8710.

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Steam Loop

HEATING AND COOLING

Ventilation

Heating, Cooling, Moistening and Renewing the Air of Textile Mills (Die Erwärmung, Kühlung, Befeuchtung und Erneuerung der Raumluft in der Textil-discussion of methods. Ills. 5500 w. industrie). E. Stadelmann. A practical Gesundheits-Ing—Nov. 14, 1908. No. 1171 D.

See also Boiler Rating, and Valves, under STEAM ENGINEERING; and Shop Heating, under MACHINE WORKS AND FOUNDRIES.

Steam Loop.

See same title, under STEAM ENGINEERING.

Steam Pipes.

The Pitch of Heating Pipes. Charles B. Starkey. Discusses points relating to steam pipe lines and their proper amount of pitch. 1200 w. Dom Engng—Aug. 14, 1909. No. 7096.

Temperature Recorders.

An Improvement in Heating and Ventilating. Royce W. Gilbert. Discusses the use of recording thermometers and hygrometers in ventilation. 4000 w. Ind Engng—June, 1909. No. 5800 C.

Temperature Regulators.

A New Automatic Temperature Regulator (Ein neuer selbsttätiger Temperaturregler). A. Busau. Illustrated description. 1900 w. Gesundheits-Ing—April 10, 1909. No. 4886 D.

See also Hot-Water Heating, under HEATING AND COOLING.

Ventilation.

Single Fan vs. Double Fan Systems of Heating and Ventilation. H. L. Williams. Discusses and compares the efficiency of these two systems. 2500 w. Heat & Vent Mag—Nov., 1908. No. 901.

Fan and Heater Arrangements. Charles L. Hubbard. Shows different methods of placing the important parts of a ventilating plant to meet various conditions. Ills. 1000 w. Heat & Vent Mag—Nov., 1908. No. 902.

Tables for Ventilating Ducts. Chouteau E. Pearce. Gives tables useful in rapidly estimating the area and weights of ducts usually employed. 500 w. Heat & Vent Mag—June, 1909. No. 5552.

Heating, Cooling and Humidifying. Sterling H. Bunnell. On methods of producing any desired conditions either automatically controlled or under the management of an engineer. 2500 w. Ind Engng—Sept. 15, 1909. No. 8031 C.

Use of Ozone Generators in the Ventilation of Buildings. Illustrated account of the installation in the Chicago public library. 1000 w. Heat & Vent Mag—Sept., 1909. No. 7881.

Air Purification by Ozone (Die Verwendung von Ozon zur Luftreinigung). W. Cramer. Describes apparatus for the production of ozone, methods of introducing ozone into the air of rooms, etc. Ills. 4500 w. Gesundheits-Ing—July 17, 1909. No. 7296 D.

Ventilation of Three Basement Floors of the Marshall Field Retail Store, Chicago. Illustrated description of method adopted for ventilating three stories below the street level. 2000 w. Eng Rec—Jan. 23, 1909. No. 2022.

Ventilating Scheme for a Hotel Building. Illustrates and describes the application of rectangular and round air ducts in Secor Hotel, Toledo, Ohio. 1200 w. Heat & Vent Mag—June, 1909. No. 5553.

Principles of Heating and Ventilating a Modern Building. H. W. Woodward. General discussion, with illustrated description of the heating and ventilating system of the Cuyahoga Co. Court House, Cleveland, O., which is a combination of direct radiation and mechanical ventilation. 5000 w. Ind Engng—April, 1909. No. 4074 C.

Ventilating a Twelve-Story Loft Building in New York. Illustrated description of a heating plant complying with the factory ventilating law. 4500 w. Met Work—July 10, 1909. No. 6244.

Ventilation of a Newspaper Photo-Engraving Plant. Illustrated description of a ventilating system in the photo-engraving department of San Francisco "Call," for the removal of fumes. 2000 w. Eng Rec—June 26, 1909. No. 6000.

Ventilating and Humidifying a Flax Mill. Describes the method of solving this problem at the factory of the Boston Thread & Twine Co. 1200 w. Heat & Vent Mag—Oct., 1909. No. 8756.

Modern Practice in Heating and Ventilation (Die jetzige Bewegung auf dem Gebiete der Heizungs und Lüftungstechnik). M. Haller. A general discussion of the more important features. 5500 w. Gesundheits-Ing—July 24, 1909. No. 7297 D.

Modern Systems of Heating, Ventilating, Humidifying and Cooling the Air of Buildings (I moderni Sistemi di Riscaldamento, Ventilazione, Inumidimento e Refrigeramento dell'Aria). Salvatore Spera. A brief general review of modern practice. 4000 w. Monit Tech—Sept. 10, 1909. No. 8637 D.

MECHANICAL ENGINEERING

Ventilation

Auditorium Ventilation (Die Lüftung der Säle). Ernest Schiele. A study of the ventilation of large halls. Ills. 11000 w. *Gesundheits-Ing*—July 17, 1909. No. 7295 D.

A Central Controller for a Ventilating Plant with Automatic Regulation of the Air Temperature (Zentralschalter für Lüftungsanlagen mit selbsttätiger Regulierung der Zulufttemperatur). Herr Arnoldt. A detailed description of an installation of this type. Ills. 2800 w. *Gesundheits-Ing*—Jan. 9, 1909. No. 2806 D.

Schoolhouse Ventilation in Switzerland (Lüftungseinrichtungen in schweizerischen Schulhäusern). Max Hottlinger. Describes and discusses the systems in use. Ills. Serial, 1st part. 3000 w. *Schweiz Bau*—May 29, 1909. No. 5770 B.

The Removal of Humidified Air from Rooms (Zur Berechnung von Entbehlungsanlagen). Paul Pakusa. A theoretical discussion of the design of devices for this purpose. 5000 w. *Gesundheits-Ing*—July 10, 1909. No. 7294 D.

See also Heat Losses, Hospitals, Steam

HYDRAULIC MACHINERY

Centrifugal Pumps

Heating, and Wind Effects, under HEATING AND COOLING; Mechanical Plants, under POWER AND TRANSMISSION; and Tunnel Ventilation, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS.

Wind Effects.

Effect of Wind on Heating and Ventilating. H. W. Whitten. Read before the Am. Soc. of Heat & Vent. Engrs. Discusses air leakage and reports tests made. 1500 w. *Met Work*—Jan. 30, 1909. No. 2170.

The Effect of Wind on Heating and Ventilation. H. W. Whitten. A study of heat losses and means of lessening them, window construction and related matters. General discussion. Ills. 6000 w. *Pro Engrs' Soc of W Penn*—Nov., 1908. No. 779 D.

Examples of Wind Effects on Ventilation and Heating. H. W. Whitten. Reports results of recent tests. 1500 w. *Am Soc of Heat & Vent Engrs*—July 15, 1909. No. 6467 N.

HYDRAULIC MACHINERY

Accumulators.

A System of High and Low Pressure Hydraulic Accumulators. R. F. Williams. Illustrates and describes an interesting hydraulic system at the Montreal works of the Am. Loc. Co. 700 w. *R R Age Gaz*—July 9, 1909. No. 6232.

Air Lift.

Tests Upon Compressed Air Pumping Systems of Oil Wells. Edmund M. Ivens. Description of systems and report of tests. 3500 w. *Jour Am Soc of Mech Engrs*—March, 1909. No. 3462 F.

Efficiency of the Air Lift as a Solution Pump. Leonard M. Green. Explanation of the theory, giving applications. Thinks a minimum efficiency of 70 per cent. should be attained. 2200 w. *Eng & Min Jour*—Aug. 7, 1909. No. 6942.

Centrifugal Pumps.

Centrifugal Pumps. E. N. Percy. Reviews some of the advantages and applications of centrifugal pumps. 1700 w. *Mach, N Y*—Feb., 1909. No. 2243 C.

Characteristics of the Turbine Pump. Frederick Ray. A study of the design and operation of centrifugal pumps by means of curves. 5000 w. *Power*—March 23, 1909. No. 3437.

Design of a Centrifugal Pump. A de-

tailed study. Ills. 1500 w. *Prac Engr*—Feb. 19, 1909. Serial. 1st part. No. 2880 A.

The Graphical Design of Centrifugal Pumps (Application du Calcul graphique aux Pompes centrifuges). M. Lecuir. Mathematical. Ills. 2000 w. *Rev de Mécan*—June, 1909. No. 6526 E + F.

Vane Construction (Die gegenwärtige Lage des Schaufelbaues). Egon Eickhoff. Discusses modern practice in vane design for centrifugal and turbine pumps. 3200 w. *Die Turbine*—May 20, 1909. No. 6580 D.

Centrifugal Pumps for Docking and Other Purposes. Illustrates and describes recent types of centrifugal pumps installed in shipbuilding plants. 2500 w. *Prac Engr*—Sept. 3, 1909. No. 7736 A.

Experiments with Centrifugal Pumps. J. G. Davis and W. R. Harding. Derives a general formula and describes trials made. Ills. 4500 w. *Engr, Lond*—Aug. 27, 1909. No. 7659 A.

Centrifugal Pump Efficiency. V. V. Messer. Shows the expense of running an inefficient pump, and discusses details that affect the efficiency. Ills. 2000 w. *Min & Sci Pr*—May 15, 1909. No. 4792.

Test of Four 35,000,000-Gal. Centrifugal Pumping Units at Pittsburg. Gives ex-

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Centrifugal Pumps

tracts from a report showing the results of duty tests. 1200 w. Eng News—Nov 26, 1908. No. 637.

Kinematics of One Form of Rotary Pump or Blower. Samuel W. Balch. Presents some elements in the design of one of the earliest forms of rotary pump or blower. 1500 w. Sch of Mines Qr—Nov., 1908. No. 972 D.

Methods of Priming Centrifugal Pumps. John B. Sperry. Describes some of the more common systems in use, giving directions for the proper handling of 1909. No. 6434.

Special Duty Centrifugal Pumps. John B. Sperry. Suggestions for the use of standard pumps for special duty. Ills. 1500 w. Power—July 13, 1909. No. 6314.

The Compounding of Centrifugal Pumps (Ueber die Schaltung von Schleuderpumpen). A. Laponche. A mathematical discussion of the two cases of compounding for pressure or for capacity. Ills. 3200 w. Die Turbine—Oct. 20, 1908. No. 567 D.

Balancing the Thrust in Centrifugal Pumps. L. Roedel. Explains the cause of "axial pressure," and how it affects devices designed to equalize this thrust. 2000 w. Power—Dec. 8, 1908. No. 874.

Steam Turbo High-Lift Pump. Illustrates and describes a large centrifugal pump operated by a steam turbine constructed for the Montreal Water & Power Co. 1500 w. Engr, Lond—Dec. 25, 1908. No. 1545 A.

Results of Tests on a Low-Head Centrifugal Pump (Besprechung von Versuchsergebnissen einer niederdruck-Kreiselpumpe). Johannes Bente. Gives the results in tabular form and draws conclusions from them. Ills. 1600 w. Die Turbine—Dec. 5, 1908. No. 1958 D.

The Theory of Centrifugal Pumps and Fans under Variable Operating Conditions on the Hypothesis of a Parabolic Q-H Characteristic (Zur Theorie der Zentrifugalpumpen und Ventilatoren bei veränderlichen Betriebsbedingungen unter Voraussetzung einer parabolischen Q-H-Charakteristik). E. Busse. Mathematical. Ills. Serial. 1st part. 1800 w. Zeitschr f d Gesamte Turbinenwesen—Jan. 9, 1909. No. 2696 D.

Operating and Test Results of Schwartzkopf High-Lift Centrifugal Pumps (Ausführungen und Versuchsergebnisse von Hochdruckzentrifugalpumpen der Berliner Maschinenbau-Aktiengesellschaft vormals L. Schwartzkopf). Herr

HYDRAULIC MACHINERY

Experimental Apparatus

Griessmann. Description of the pumps and tests and tabulated results. Ills. Serial. 1st part. 1600 w. Zeitschr f d Gesamte Turbinenwesen—Feb. 20, 1909. No. 3380 D.

Centrifugal Pump Discharges (Ueber Entlastungsvorrichtungen bei Zentrifugalpumpen). Otto Gottschling. Discusses various designs. Ills. 3000 w. Die Turbine—June 5, 1909. No. 6582 D.

The Output of Centrifugal Pumps and Water-Lifting Wheels (Die Leistungen von Kreiseln und Schöpfädern). H. Hagens. Considers a number of examples of both classes of water-lifting apparatus. Ills. Serial. 1st part. 6600 w. Zeitschr d Ver Deutscher Ing—July 3, 1909. No. 7465 D.

A Note on the Theory of the Centrifugal Pump (Beitrag zur Theorie der Zentrifugalpumpen). G. Zerkowitz. Mathematical. 5500 w. Zeitschr d Oest Ing u Arch Ver—Sept. 24, 1909. No. 8692 D.

See also Fire Boats, under MARINE AND NAVAL ENGINEERING; Pumps, under HYDRAULIC MACHINERY; and Water, under MEASUREMENT.

Cornish Pumps

Cornish Pumps and Pumping Engines. Henry F. Collins. Notes on the advantages of Cornish pumping. 1800 w. Min & Sci Pr—Feb. 20, 1909. Serial. 1st part. No. 2765.

Discharge Coefficients.

See same title, under CIVIL ENGINEERING, WATER SUPPLY.

Electric Pumps.

See Irrigation, under CIVIL ENGINEERING, WATER SUPPLY; Pumps, under HYDRAULIC MACHINERY; and Pumping under MINING.

Electric Pumping.

The Electro-Hydraulic Pumping Plant at the Bristol Docks. W. A. Clatworthy. Read before the Newcastle Sec. of Inst. of Elec. Engrs. Illustrated description of a plant to provide power for operating cranes, capstans, lock gates, bridges, etc., in connection with the Bristol Docks. 2500 w. Elec Engr, Lond—Feb. 12, 1909. No. 2581 A.

Electrically-Operated Pumping and Air-Compressing Installation at Messrs. Harland & Wolff's Shipbuilding Yard, Belfast. Brief illustrated description. 3000 w. Elect'n, Lond—Feb. 26, 1909. No. 3054 A.

Experimental Apparatus.

An Experimental Hydraulic Cylinder. E. G. Coker. Illustrated description of a

MECHANICAL ENGINEERING

Hydraulic Tables

cylinder hung vertically, so that the lower face would be available for vertical jets, and be entirely free of supports. 1000 w. Engng—March 19, 1909. No. 3616 A.

Hydraulic Tables.

Hydraulic Tables. Joseph H. Harper. An outline of work attempted by the writer. 1500 w. Jour Assn of Engng Socs—Feb., 1909. No. 3962 C.

Hydrodynamics.

Hydraulic Machinery. James W. Nelson. Deals with hydrostatics and hydrodynamics in their relation to machinery, especially some of the more common applications in the development and transmission of power. Ills. 14500 w. Pro Brooklyn Engrs' Club, No. 83—1908. No. 5874 F + F.

Incorrect Application of Hydraulic Principles (Ueber unrichtige Anwendung hydraulischer Sätze). Donat Banki. A mathematical criticism of certain errors in hydraulic literature. Ills. 5500 w. Zeitschr d Ver Deutscher Ing—Sept. 11, 1909. No. 8914 D.

The Influence of Molecular Attraction on Hydrodynamic Theory (Sull' Influenza delle Attrazioni molecolari nei Fatti idrodinamici). P. Alibrandi. A mathematical and theoretical discussion of fundamental hydraulic theorems. Ills. 5200 w. Ann d Soc d'Ing e d Arch Ital—Jan. 1, 1909. No. 2648 F.

Hydrostatics.

Hydraulic Pressure and Transmission of Power. George E. Evans. Prize Essay. The present number gives a brief historical review of the use of water under pressure as a motive power, and a study of the underlying principles. Ills. 4500 w. Plumb & Dec—May 1, 1909. Serial, 1st part. No. 4661 A.

Pelton Wheels.

Running Losses in Pelton Wheels Under Variable Peripheral Speed (Arbeitsverlust bei der Peltonradschaufel infolge der variablen Umfangsgeschwindigkeit). H. Egli. Mathematical. Ills. 1500 w. Zeitschr f d Gesamte Turbinenwesen—Aug. 30, 1909. No. 7978 D.

See also Water Wheels, under HYDRAULIC MACHINERY.

Penstocks.

A Diagram for Calculating Penstocks. Richard Muller. Gives diagram for calculating steel pipes of large size, with explanation of its use. 1600 W. Eng Rec—Nov. 14, 1908. No. 252.

HYDRAULIC MACHINERY

Pumping Engines

The Design of Steel Pipes for Hydro-Electric Plants. Richard Muller. Diagrams and discussion of the design of steel penstocks for power plants. 2500 w. Eng Rec—May 1, 1909. No. 4394.

Penstocks for Water Power Plants. Frank Koester. Information concerning recent practice, materials used, methods of construction, etc. Ills. 3000 w. Eng Rec—Feb. 20, 1909. No. 2565.

Pipe Flow.

Flow of Water in Pipes and Flumes. Franklin Van Winkle. Discusses drop in pressure due to friction, giving charts for determining the size of pipe for a given flow. Ills. 4000 w. Power—Nov. 10, 1908. No. 162.

Piping.

Water Hammer in Pipe Lines (Les Coups de Bélier dans les Conduites d'Eau). A. Rateau. A mathematical discussion of the stresses induced in pipe lines by the sudden closing of valves, etc. Ills. 7000 w. Bul Sci de l'Assn des Elèves—April, 1909. No. 5700 D.

Pressure Regulators.

See Turbine Pressures, under HYDRAULIC MACHINERY.

Pumping.

Pumping by Oil-Engines: Divi Irrigation Works. Percy Hawkins. Describes a scheme for irrigating this island in the Bay of Bengal, at the mouth of the Kistna River. 3000 w. Inst of Civ Engrs—No. 3771. No. 8166 N.

Pumping Engines.

History of Pumping Engines. C. A. Hague. Illustrated lecture, reviewing the history since 1601. Discussion. 7000 w. Pro Am W-Wks Assn—1908. No. 5987 N.

High Duty vs. Low Duty Pumping Machinery. J. N. Chester. Considered from the operator's standpoint. Discussion. 7800 w. Pro Am W-Wks Assn—1908. No. 5988 N.

Tests of Modern High Duty Pumping Engines (Crank and Fly-Wheel Type) With and Without Superheated Steam. John Primrose. Reports tests of engines for Cincinnati, Ohio. 1000 w. Am W-Wks Assn—June, 1909. No. 5925 N.

Slip of Pumping Engines. The importance of considering it in waterworks calculations is shown, results of tests given, and methods for measuring it described. 2000 w. Munic Jour & Engr—Dec. 16, 1908. No. 1040.

Superheating for Duty. E. H. Foster. Presents the advantages in using super-

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Pumping Engines

heated steam in pumping engines. Ills. 1500 w. Am W-Wks Assn—June, 1909. No. 5917 N.

Working Results of Pumping Engines Operated by Producer Gas. D. Hastings Irwin. Read before the Assn. of Water Engrs. Gives data taken from plants in operation. 2000 w. Surveyor—July 9, 1909. No. 6416 A.

New Pumping Engines for the Metropolitan Water Board. Illustrated description of the engines at Kempton Park Station. 2000 w. Engr, Lond—Oct. 23, 1908. No. 80 A.

Triple-Expansion Engines and Pumps for Burma Oil Pipe-Line. Illustrated description. 600 w. Engng—Dec. 18, 1908. No. 1372 A.

Compound Cornish Pumping Engines. W. Percy Gauvain. Remarks on the latest type of these engines, and the general principles which govern the working. Ills. 2200 w. Min & Sci Pr—July 10, 1909. No. 6319.

See also Cornish Pumps, under HYDRAULIC MACHINERY.

Pumping Plants.

Boiler Equipment, Practice and Results at Pumping Station, Water Department, Harrisburg, Pa. George G. Kennedy. Brief description of a satisfactory plant. 1800 w. Am W-Wks Assn—June, 1909. No. 5914 N.

Notes on the Designing of Modern Water Works Pumping Stations. Ernest R. Matthews. With special reference to the new pumping station in course of erection at Bridlington. Ills. 3000 w. Surveyor—April 23, 1909. No. 4452 A.

High Duty Pumping Records at North Point Pumping Station, Milwaukee, Wis. Cornelius T. Myers. Reviews the history of this pumping station and the progress made in the manufacture of pumping engines as there represented; also gives results. 3500 w. Am W-Wks Assn—June, 1909. No. 5905 N.

The Garden City Pumping Plant. F. W. Hanna. Illustrated description of a power plant in connection with an irrigation project in Kansas. 1200 w. Eng Rec—April 24, 1909. No. 4168.

A Power Plant for Rice Irrigation. John W. Maxcy. Brief description of a plant near Wharton, Texas. Ills. 700 w. Eng Rec—March 20, 1909. No. 3274.

The Intake Tunnel and Crib of the Lawrence Avenue Pumping Station, Chicago. Illustrated description of this portion of Chicago's sewerage system and

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its construction. 2500 w. Eng Rec—Dec. 19, 1908. No. 1053.

The Repairs to the Evansville, Indiana, Pumping Station. Illustrates and describes extensive repairs recently completed. 2200 w. Eng Rec—Dec. 26, 1908. No. 1245.

Pumping Station for Flood-Water at Southsea. Illustrates and describes the object and construction of this important engineering work and the appliances by which the mechanical work is automatically carried on. 3000 w. Engng—Jan. 22, 1909. No. 2219 A.

See also Electric Pumping, and Water Wheels, under HYDRAULICS; Irrigation, under CIVIL ENGINEERING, WATER SUPPLY; and Pumping, under MINING AND METALLURGY, MINING.

Pumping Stations.

Test of Large Sewage Pumping Station. Simpson Rice. Illustrates and describes the 39th Street station in Chicago, and the methods employed to determine the volume of sewage and water pumped and average head. 3000 w. Power—Aug. 3, 1909. No. 6819.

Steam-Driven Pumping Plant for Deep Wells and Boreholes. Alfred Towler. Read before the Assn. of Water Engrs. Considers plants in which the engine is out of suction distance from the water to be pumped, indicating the principles affecting the durability and efficiency of rod pumps. Ills. 6000 w. Mech Engr—July 2, 1909. No. 6299 A.

Winnipeg High-Pressure Fire Service. Illustrated description of the gas-driven high-pressure fire service water supply installed at a cost of nearly a million dollars. 2500 w. Engr, Lond—June 25, 1909. No. 6286 A.

Pumps.

Suction, as Applied to Pumps. William Perry. Reviews the early history of suction pipes, explaining their action. 2000 w. Pro Am W-Wks Assn—1908. No. 5936 N.

Miscellaneous Improvements. W. H. Wakeman. Illustrates and describes some pump governors, lubricators, etc. 1500 w. Power—Feb. 9, 1909. No. 2375.

Gas Engine-Driven Accumulator Pumps. Illustrations with brief descriptions. 500 w. Engr, Lond—Jan. 22, 1907. No. 2224 A.

The High-Pressure Fire-Service Pumps of Manhattan Borough, City of New York. Prof. R. C. Carpenter. Description of pumps and pumping system with results

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of tests. Ills. 6000 w. Jour Am Soc of Mech Engrs—Sept., 1909. No. 8096 F.

A 42-inch Low Pressure Elevator Pump. Describes a pump run on the exhaust of electric light engines in a large retail establishment. Ills. 950 w. Power—June 8, 1909. No. 5318.

The Humphrey Gas-Pump. Illustrated description of a novel gas-pumping plant, with report of tests made at Dudley Port, by Prof. W. Cawthorne Unwin. 3800 w. Engng—Oct. 15, 1909. No. 8930 A.

Pump with Increased Efficiency at High Speeds. Illustrated description of a recent invention by Hans Milner, Austria, and the method of operation. 1500 w. Prac Engr—Jan. 22, 1909. No. 2210 A.

See also Water Wheels, under HYDRAULIC MACHINERY; and Machinery, and Pumping, under MINING AND METALLURGY, MINING.

Pump Valves.

Pump Valves and Valve Areas. A. F. Nagle. Aims to show that the proportioning the valve area to the plunger area is defective. A critical study. 2500 w. Jour Am Soc of Mech Engrs—Mid-Oct., 1909. No. 8749 F.

Valves for High-Speed Pumps. Illustrated description of a new design. 700 w. Engng—May 14, 1909. No. 4962 A.

Researches on the Motion of Automatic Pump Valves (Untersuchung der Bewegung selbsttätiger Pumpenventile). K. Korner. Gives time diagrams for a number of recent types. Ills. 2000 w. Zeitschr d Ver Deutscher Ing—Nov. 14, 1908. No. 1193 D.

Rams.

Hydraulic Rams for Isolated Water Supply. J. S. Lane. An illustrated discussion of hydraulic rams for isolated water supply, their setting, performance, etc. 2500 w. Met Work—Dec. 12, 1908. No. 933.

Riveting Machines.

Some Notes on Hydraulic Plate Cutting and Riveting Machines. Norman S. Trustrum. Read before the Jun. Inst. of Engrs. Discusses materials, methods and related matters. Ills. 2000 w. Prac Engr—Nov. 13, 1908. Serial. 1st part. No. 427 A.

Surge Tanks.

The Surge Tank in Water Power Plants. R. D. Johnson. Abstract of paper with continued discussion and author's closure. 9000 w. Jour Am Soc of Mech Engrs—Jan., 1909. No. 1855 F.

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Turbine Measurements

The Stand Pipe in Water Power Plants. Irving P. Church. An investigation of the height of surge occurring in the stand pipe, as well as the drop, when the gates are suddenly opened. 2500 w. Cornell Civ Engr—Oct., 1909. No. 8840 C.

The Surge Tower of the Turnwater Power Plant. Illustrated description of an interesting feature of the power plant at Turnwater Canyon, Washington, built to furnish electric power to operate trains through the Cascade tunnel. 2000 w. Eng Rec—June 12, 1909. No. 5483.

A Note on the Design of Surge Tanks (Beitrag zur Bemessung des Inhalts von Wasserschlössern). Discusses mathematically the method of determining the capacity for which they should be designed. Ills. 1700 w. Schweiz Bau—Jan. 30, 1909. No. 2692 B.

See also Turbine Pressures, under HYDRAULIC MACHINERY.

Turbine Design.

Turbine Diagrams (Ueber Turbinendiagramme). E. Braun. Mathematical discussion of the graphical design of water turbines. Ills. 1600 w. Zeitschr f d Gesamte Turbinenwesen—June 30, 1909. No. 6585 D.

Turbine Efficiency.

The Relation of the Efficiency of Water Turbines to Fall, Temperature of Water, Size of Turbines and Roughness of Conduit (Die Abhängigkeit des Wirkungsgrades des Wasserturbinen von Gefälle, Wasserwärme, Turbinengrösse und Rauheit der Kanäle). Dr. Camerer. Mathematical. 3000 w. Zeitschr d Ver Deutscher Ing. No. 8916 D.

Turbine Governing.

The Control of the Turbine Under Varying Load (Das Verhalten der Turbine bei verschiedener Belastung). J. Bartl. An extensive theoretical and mathematical discussion. Ills. Serial. 1st part. 3500 w. Zeitschr d Oest Ing u Arch Ver—Nov. 6, 1908. No. 1179 D.

See also Operation, under ELECTRICAL ENGINEERING, GENERATING STATIONS.

Turbine Measurements.

Measurements on Turbine Conduits (Ueber Messungen an Turbinenkanälen). Hans Jaeger. An elaborate discussion of methods of hydraulic measurement in turbine plants. Ills. Serial. 1st part. 2500 w. Zeitschr f d Gesamte Turbinenwesen—Aug. 10, 1909. No. 7976 D.

Measurements on Turbine Conduits (Quelques Mesures effectuées sur les

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Canaux de Turbines). J. F. Audouin. A translation of H. Jaeger's paper in the *Zeitschrift für das gesamte Turbinenwesen*. Ills. Serial. 1st part. 1200 w. *Rev Indus*—Sept. 11, 1909. No. 8624 D.

Turbine Plants.

The Design of Intakes for Hydro-Electric Plants. Jean. Bart. Balcomb. Gives method employed by the writer, describing an actual case. 1200 w. *Eng News*—April 8, 1909. No. 3854.

A Pelton-Francis Turbine Installation at Schaghticoke, N. Y. Illustrated description of a 20000 horse power installation. 1500 w. *Ir Age*—July 15, 1909. No. 6342.

Recent Turbine Plants (Neuere Turbinen-Anlagen). Wilhelm Müller. Illustrated description of a number of plants with special reference to high speed and methods of governing. Serial, 1st part. 1300 w. *Die Turbine*—Dec. 20, 1908. No. 1960 D.

Economic Considerations in the Design of Water-Power Plants (Wirtschaftliche Gesichtspunkte beim Veranschlagen von Wasserkraftmaschinen). R. Camerer. A general discussion of a number of important points influencing economy in construction and operation. Ills. 7400 w. *Zeitschr d Ver Deutscher Ing*—Nov. 28, 1908. No. 1196 D.

Means of Preventing Danger from High Water in Water-Power Plants (Technische Massnahmen, um den Rückstau des Hochwassers für Wasserkraftanlagen unschädlich zu machen). Herr Danckwerts. A discussion of flood-water regulation. Ills. Serial. 1st part. 2500 w. *Die Turbine*—March 20, 1909. No. 4271 D.

A Suggestion for Improvement in the Use of Fine Screens in Water-Power Plants (Vorschläge für eine Verbesserung der Feinrechen bei Wasserkraftanlagen). Theodor Koehn. A discussion of the best means of protecting turbine machinery against the entrance of foreign matter in the water. Ills. 5000 w. *Die Turbine*—April 20, 1909. No. 4879 D.

Water-Power Plant and Poppenweil Rolling Weir on the Neckar (Wasserkraftanlage und Walzenwehr Poppenweiler am Neckar). Wilhelm Müller. Illustrated description of the plant and its construction. Serial, 1st part. 2500 w. *Zeitschr f d Gesamte Turbinenwesen*—July 30, 1909. No. 7291 D.

The Luzern-Engelberg Water-Power Plant (Die Wasserkraftanlage Luzern-Engelberg). Andreas Stamm. Describes interesting features of the turbine instal-

lation. Ills. 1800 w. *Die Turbine*—June 20, 1909. No. 6584 D.

The Operation of Water-Power Plants in Winter (Der Betrieb einer Wasserkraftanlage im Winter). W. v. Winkler. Discusses the methods of coping with the ice problem. Ills. 6000 w. *Elektrotech u Maschinenbau*—Aug. 15, 1909. No. 7993 D.

See also Penstocks and Surge Tanks, under HYDRAULIC MACHINERY.

Turbine Pressures.

Pressure Fluctuations in Turbine Pipe Lines. Prof. A. Budau. A discussion of devices for pressure regulation and theoretical investigations necessary for safety, with some experiences with long pipe lines. Ills. 9000 w. *Jour Assn of Engng Socs*—Oct., 1908. No. 781 C.

Surge-Tank Problems (Wasserschlossprobleme). Franz Prasil. Exhaustive mathematical discussion of their design and operation for turbine plants. Ills. Serial. 1st part. 4500 w. *Schweiz Bau*—Nov. 21, 1908. No. 1158 B.

Turbines.

Characteristics of Modern Hydraulic Turbines. Chester W. Larner. A study by means of tests, of the characteristics of several types, indicating in a general way the conditions of service for which they are adapted. Ills. 10500 w. *Pro Am Soc of Civ Engrs*—Aug., 1909. No. 7367 E.

A Comparison of American High Speed Runners for Water Turbines. S. J. Zowski. Aims to show how far American manufacturers have progressed in the attempt to secure high speed and high capacity simultaneously and to compare the results of respective runner types. Ills. 4000 w. *Eng News*—Jan. 28, 1909. No. 2151.

The Development of Multi-Stage Turbines (Die Entwicklung der mehrstufigen Wasser-Turbine). R. Löwy. A historical review, with notes on present development. Ills. 2800 w. *Elektrotech u Maschinenbau*—May 30, 1909. No. 5961 D.

High-Speed Francis Turbines (Francisturbinen-Schnellläufer). Ernst Reichel. A review of American and European practice. Ills. 2300 w. *Zeitschr f d Gesamte Turbinenwesen*—Sept. 30, 1909. No. 8678 D.

The Schulz Turbine (Die Schulz-Turbine). Herr Forst. Illustrated description, test results, etc. Serial, 1st part. 1600 w. *Die Turbine*—Dec. 5, 1908. No. 1959 D.

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Absolute Clearance Pressure in Turbines (Das Wesen des Spaltüberdruckes bei Turbinen). N. Baashuus. Mathematical discussion. Ills. 1500 w. Zeitschr f d Gesamte Turbinenwesen—Nov. 30, 1908. No. 1163 D.

The Basis of the Lorenz Turbine Theory (Die Grundlagen der Lorenzschen Theorie der Kreiselräder). R. Löwy. A mathematical explanation. Ills. Serial, 1st part. 2000 w. Zeitschr f d Gesamte Turbinenwesen—May 10, 1909. No. 5777 D.

Brake Tests on a Lorenz Turbine (Bremsergebnisse einer Lorentzturbine). Robert Goldschmidt. Describes the machine and tests, and discusses the results. Ills. Serial, 1st part. 2000 w. Zeitschr f d Gesamte Turbinenwesen—Feb. 20, 1909. No. 3379 D.

Oscillations in Pipe Lines and Their Influence on the Operation of Turbines (Schwingungen in Flüssigkeitsleitungen und ihr Einfluss auf den Gang von Kreiselrädern). H. Lorenz. Mathematical. Ills. Serial, 1st part. 3500 w. Zeitschr f d Gesamte Turbinenwesen—Oct. 10, 1908. No. 564 D.

See also Water, under MEASUREMENT; and Hydro-Electric, under ELECTRICAL ENGINEERING, GENERATING STATIONS.

Turbine Testing.

Water Measurement in the Turbine Testing Laboratory of the Berlin Technical High School (Wattmessungen in der Versuchsanstalt für Wassermotoren an der Königl. Techn. Hochschule zu Berlin). Ernst Reichel. Illustrated description of the devices used. 3300 w. Zeitschr d Ver Deutscher Ing—Nov. 14, 1908. No. 1192 D.

Turbine Tests.

Tests of a Horizontal Francis Turbine (Versuche an einer dreifachen

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Horizontal-Francis turbine). Gives the results in a series of curves. Ills. 1800 w. Zeitschr f d Gesamte Turbinenwesen—May 29, 1909. No. 5782 D.

Brake Tests on a 300 Horse-Power Horizontal Turbine (Bremsresultate einer Kesselturbine von 300 P.S.). Karl Gottwein. Describes the installation and gives results. Ills. 2000 w. Zeitschr d Oest Ing u Arch Ver—June 18, 1909. No. 6596 D.

Water-Lifting Wheels.

See Centrifugal Pumps, under HYDRAULIC MACHINERY.

Water Wheels.

Building Pelton Wheels. W. Burns. Brief illustrated description of methods used. 1200 w. Power—July 6, 1909. No. 6203.

Power from the Current of the River Clutha (N. Z.). Frank Reed. Description of wheel pumping plants, utilizing a river having a velocity varying from 5 to 8 miles per hour. Ills. 1500 w. Aust Min Stand—Feb. 17, 1909. No. 3588 B.

Current-Pumps on the Clutha River. Frank Reed. Drawings, photograph and description of Payne's patent current-wheel pumping plant. 1200 w. N Z Mines Rec—Feb. 16, 1909. No. 3884 B.

Wave Motors.

The Status of the Wave Motor. James T. Barkeley. Considers the different forms and their effectiveness, cost of installation and upkeep. 3000 w. Power—April 13, 1909. No. 3920.

The Snee Wave Motor and Its Possibilities. Franklin Van Winkle. Illustrated description of a turbine construction designed to utilize the energy of ocean waves and currents to develop power. 4500 w. Power—March 2, 1909. No. 2905.

MACHINE ELEMENTS AND DESIGN

Ball Bearings.

Some Notes on Ball Bearings. Asher Golden. Methods of eliminating friction, materials and various related subjects. Ills. 4000 w. Mach, N Y—May, 1909. No. 4429 C.

Gages and Fixtures for Testing Ball Bearings. Illustrates and describes tools used. 2500 w. Am Mach—Vol. 32. No. 26. No. 6097.

Ball Bearings—Origin, Manufacture, Design and Application. E. Sachs. Address before the Polytechnische Verein. Ills. 1500 w. Automobile—May 13, 1909. No. 4654.

Ball Bearings in the Construction of Ship Machinery (Kugellager im Schiffsmaschinenbau). Illustrates a number of applications. 2000 w. Schiffbau—Sept. 8, 1909. No. 8668 D.

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Connecting Rods

See also Testing Machines, under MEASUREMENT; and Shop Practice, under MACHINE WORKS AND FOUNDRIES.

Bearings.

Ring-Oiled Conical-Seated Bearings for Machine Tools. Discusses bearings for high-speed tools and means by which they could be improved. 1500 w. Mech Wld—March 5, 1909. No. 3156 A.

Bolts.

The Strength of Bolts. Brief discussion of the stresses in bolts under various conditions. 900 w. Mech Wld—April 9, 1909. No. 3990 A.

Bosses.

The Diameter and Length of Bosses. R. A. Lewis. Gives coefficients illustrating the prevailing proportions of a boss and arms to their shaft. 800 w. Engr, Lond—June 18, 1909. No. 6050 A.

Brakes.

Dynamic Braking. Henry D. James. Considers applications, methods of control, and cost. Ills. 2500 w. Elec Jour—April, 1909. No. 3952.

Electrically Operated Brakes for Industrial Purposes. H. A. Steen. Considers typical modern designs. Ills. 4000 w. Pro Engrs' Soc of W Penn—Nov., 1908. No. 778 D.

Electrically Operated Brakes for Industrial Purposes. H. A. Steen's paper is discussed. 4000 w. Pro Engrs' Soc of W Penn—March, 1909. No. 3815 D.

See also same title, under ELECTRICAL ENGINEERING, DYNAMOS AND MOTORS.

Cams.

Marine Engine Cams. Albert H. Ziegler. The designing and constructing of cams to obtain accurate cam action is discussed. Diagrams. 2500 w. Rudder—May, 1909. No. 4593 C.

A Few Notes on Cam Design. Bertram C. Joy. Studies the problem of designing a cam which will give the best combination of silent running with powerful working. 2500 w. Autocar—Jan. 30, 1909. No. 2339 A.

Laying Out Cams for Brown and Sharpe Screw Machine. F. W. Wright. Diagrams and description. 1500 w. Mech Wld—May 7, 1909. No. 4664 A.

See also Stamp Mills, under MINING AND METALLURGY, ORE DRESSING AND CONCENTRATION.

Chains.

A Weldless Chain Shackle. Illustrated description of the Kenter shackle, explaining its advantages. 1200 w. Engr, Lond—April 9, 1909. No. 4039 A.

Chucks.

The Evolution of the Magnetic Chuck. O. S. Walker. Aims to correct wrong impressions in regard to the operation of magnetic chucks, and to illustrate some special applications. Ills. 1800 w. Am Mach—Vol. 32. No. 6. No. 2459.

Circle Division.

Table for Spacing Holes in Circles. F. W. Seidensticker. A useful table for dividing circles into parts up to five hundred. 1000 w. Am Mach—Vol. 31. No. 51. No. 1073.

Clutches.

Principles in Design of Friction Clutches. J. Richards. Considers the proper time interval for engaging the clutch, and suggests a construction embodying this feature. Ills. 2500 w. Am Mach—Vol. 32. No. 33. No. 7167.

Friction Clutches to Operate Reciprocating Machines. Thomas R. Shaw. Suggests a method of operating friction clutches so as to engage in a pre-determined time. Ills. 1000 w. Mech Engr—Oct. 15, 1909. No. 8880 A.

Clutches. Thomas R. Shaw. An illustrated article dealing particularly with some of the clutches used in machine tools. 2800 w. Mech Engr—June 4, 1909. Serial, 1st part. No. 5522 A.

Theory and Design of Friction Clutches. Michael Richard Conway. Discusses the limitations of materials and workmanship, features of design, etc. Ills. 2500 w. Am Mach—Vol. 32. No. 7. No. 2513.

Formulas for Cone Clutches. Gives formulas and data sheet containing summary. 500 w. Mach, N Y—Oct., 1909. No. 8285 C.

Clutches. Discussion of paper by Henry Souther. 2000 w. Jour Am Soc of Mech Engrs—Nov., 1908. No. 646 F.

Variable Speed Clutch for Machine Tools. Illustrated description of a clutch to be used as a substitute for cone pulleys and other speed-varying devices. 1000 w. Am Mach—Vol. 31. No. 50. No. 912.

Clutches (Quelques Embrayages). Illustrated detail description of a large number of recent devices. 5000 w. Rev de Mécan—Dec., 1908. No. 2103 E + F.

Connecting Rods.

Stress Distribution in Connecting Rod Heads (Die Spannungsverteilung in

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Crane Hooks

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geschlossenen Schubstangenköpfen). A. Watzinger. Mathematical and graphical discussion. Ills. 1800 w. Zeitschr d Ver Deutscher Ing—June 26, 1909. No. 6732 D.

Crane Hooks.

Crane Hooks. H. J. Mastenbrook. Gives formulae and tables for calculating dimensions, with explanation. 600 w. Mach, N Y—April, 1909. No. 3642 C.

An Investigation of Strength of Crane Hooks. Walter Rautenstrauch. Results obtained by a theoretical study are closely checked by tests of seven hooks ranging from 2 to 30 tons capacity. Diagrams. 2500 w. Am Mach—Vol 32, No. 40. No. 8389.

The Design of Curved Machine Members Under Eccentric Load. Prof. Walter Rautenstrauch. Reports an investigation of crane hooks as an example of a curved beam, developing formulæ. 1000 w. Jour Am Soc of Mech Engrs—Mid-Oct., 1909. No. 8752 F.

Crank Shafts.

Automobile Motor Crankshafts Discussed. Thomas J. Fay. The present number considers the materials used. Ills. 1500 w. Automobile—Dec. 17, 1908. Serial. 1st part. No. 1028.

Crank Shafts for Gas Engines. Horace Allen. Discusses methods of providing for the special stresses. Diagrams. 1500 w. Cassier's Mag—Jan., 1909. No. 1730 B.

Guests's Law of Combined Stress. C. A. Smith. Sketches the reasoning for a general case, and applies it to a particular example. Diagrams. 3000 w. Engng—April 23, 1909. No. 4459 A.

The Graphical Design of Crank Shafts (Graphische Berechnung von Kurbelwellen). Adolf Knelles. Mathematical. Ills. 2000 w. Elektrotech Rundschau—Nov. 7, 1908. No. 1184 D.

The Influence of the Angles of a Crank Shaft on its Deformation (Ueber den Einfluss der Kröpfungsecken auf die Formänderung von gekröpften Kurbwellen). Eugen Meyer. Mathematical discussion of the stresses in crank-shaft angles. Ills 2800 w. Zeitschr d Ver Deutscher Ing—Feb. 20, 1909. No. 3568 D.

A System of Crank Shafts with Slotted Side Plates (Un Système d'Essieux coulés à Flasques évidées). Ed. Sauvage. Brief description of crank axles of which the side plates are not solid. Ills. 1300 w. Bul Soc d' Encour—May, 1909. No. 6522 G.

See also Gas Engines, under COMBUSTION MOTORS.

Crushers.

Balancing a Rock Crusher—A Peculiar Problem. O. P. Hood. Presents the method of determining the unbalanced forces by graphical solution, and of reducing the vibration. 2500 w. Am Mach—Vol. 31. No. 48. No. 626.

Cylinders.

Distortions Symmetrical About the Axes of Thin-Walled Cylinders (Achsen-symmetrische Verzerrungen in dünnwandigen Hohlzylindern). Rudolf Lorenz. Mathematical. Ills. 6500 w. Zeitschr d Ver Deutscher Ing—Oct. 24, 1908. No. 604 D.

Investigation of the Stresses in Thick-Walled Hollow Cylinders Under Internal Pressure (Untersuchungen über die Anstrengung dickwandiger Hohlzylinder unter Innendruck). W. Krüger. Describes tests and their theory, and gives results. Ills. Serial. 1st part. 5500 w. Zeitschr d Ver Deutscher Ing—Aug. 28, 1909. No. 8156 D.

Drafting.

Present Practice in Drafting-Room Conventions. John S Reid. Summary of answers to questions on methods. 3000 w. Am Mach—Vol. 31. No. 47. No. 362.

Drafting Machines.

Universal Drafting Machines of New Design. Illustrates and describes machines with ball-bearing joints and tubular rods. 1000 w. Am Mach—Vol. 32. No. 22. No. 5209.

Drafting Rooms.

Some Items of Drawing-Office System. W. Lawrence. Suggests items that may save time and tend to efficiency. 2000 w. Elec Rev, Lond—Dec. 25, 1908. No. 1518 A.

Drawings.

An Important Possibility in Working-Drawings. Describes the advantages of a method of photographic reduction. 2500 w. Eng News—Jan. 28, 1909. No. 2152.

Eccentric Loading.

The Determination of the Pressures on the Supports of Structures Loaded Eccentrically. H. F. Harris. Considers the conditions of possible loading under three general classes. 1000 w. Prac Engr—Sept. 3, 1909. No. 7735 A.

Flat Plates.

Researches on the Distorsion and Strength of Flat Plates (Versuche über die Formänderung und die Widerstandsfähigkeit ebener Wandungen). C. Bach. Reports extensive tests, the results of

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which are applicable to both steel and reinforced-concrete construction. Ills. Serial. 1st part. 3800 w. Zeitschr d Ver Deutscher Ing—Nov. 7, 1908. No. 1188 D.

Flywheels.

Simplified Methods for Fly-Wheel Calculations. R. J. Williams. Mathematical. 700 w. Mach, N Y—Oct., 1909. No. 8288 C.

Use Cylindrical Flywheels for Safety. A. L. Hodges. Claims that widening rim and shortening radius will obviate explosions without sacrificing convenience, cost or efficiency. 1500 w. Power—May 4, 1909. No. 4489.

The Design of Rapidly Rotating Fly Wheels (Zur Berechnung schnelllaufender Scheibenräder). Herr Roemmelt. Mathematical. Ills. 5000 w. Elek Kraft u Bahnen—Dec. 4, 1908. No. 1988 D.

Gear Boxes.

An Eighteen-Speed-Gear Box. C. A. Legge. Line engravings with description. 700 w. Am Mach—Vol. 31. No. 52. No. 1280.

Gears.

The Design of Worm Gearing. Considers the exact geometrical nature of worm gearing, and the causes of inefficiency in worm wheels, describing a method of designing worm teeth which will gear. 1200 w. Prac Engr—June 11, 1909. Serial. 1st part. No. 5629 A.

A Discussion of Involute-Spur and Helical Gearing. Frank Burgess. Considers the requirements and some problems not yet solved. 1000 w. Am Mach—Vol. 32. No. 9. No. 2936.

Worm Gears (Die Schraubenräder). H. Witz and L. Gaisser. Mathematical discussion of their design. Ills. 2500 w. Zeitschr f Werkzeug—June 5, 1909. No. 6590 D.

Efficiencies of Various Cut Gears. G. Everett Quick. Describes apparatus used and gives results obtained in testing automobile spur, bevel, worm and crown gears. Ills. 1700 w. Am Mach—Vol. 32. No. 33. No. 7166.

Bevel Gear Tables. Charles Watts. Tables for the convenience of engineers and draughtsmen, with explanatory notes. 1000 w. Engr, Lond—Aug. 13, 1909. No. 7331 A.

Simplified Gear Formulas. C. R. Whittier. Gives a three quadrant gear chart for the rapid solution of spur and bevel gear problems, based on Lewis formula, with explanation. 1500 w. Mach, N Y—Aug., 1909. No. 6803 C.

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Factors for Proportioning Spur Gears. Charles H. Logue. Gives formulæ and constants for proportioning solid and split spur gears and for estimating weights. 2500 w. Am Mach—Vol. 32. No. 39. No. 8202.

Epicyclic Trains of Wheels. H. G. Taylor. Explains the rules regarding such wheels. 1000 w. Prac Engr—Oct. 15, 1909. No. 8874 A.

Skew Bevel Gears. J. A. Utts. Illustrates details of the gears and describes method of making them. 1000 w. Am Mach—Vol. 32. No. 8. No. 2775.

Generating Gear Teeth of Increased Strength and Standard Hobs. H. T. Miller. Illustrated explanation of modified teeth and the conditions of contact. 1200 w. Am Mach—Vol. 31. No. 49. No. 770.

The Hindley Worm and Gear. John Edgar. An explanation of the theory of this worm gear. Ills. 2500 w. Mach, N Y—Dec., 1908. No. 761 C.

Spur Gearing on Heavy Railway Motor Equipments. Norman Litchfield. Gives facts gathered in a study of this subject. Ills. 1600 w. Jour Am Soc of Mech Engrs—Mid-Nov., 1908. No. 655 F.

Spur Gearing on Heavy Railway Motor Equipments. A discussion of Norman Litchfield's paper dealing with the breakage of gearing in heavy electric railway service. 3500 w. Jour Am Soc of Mech Engrs—Feb., 1909. No. 2409 F.

Interchangeable Involute Gear Tooth Systems. Ralph E. Flanders. Discusses the effect of varying the pressure angle and addendum. 4500 w. Jour Am Soc of Mech Engrs—Mid-Nov., 1908. No. 654 F.

Interchangeable Involute Gear Tooth Systems. Discussion of Ralph E. Flanders' paper. 8500 w. Jour Am Soc of Mech Engrs—Feb., 1909. No. 2410 F.

Speed of Spur Gears. Charles H. Logue. A discussion of the safe speed limit and how to determine it. 1500 w. Am Mach—Vol. 32. No. 22. No. 5210.

Steels for Gears. Louis P. M. Revillon. Abstract of report on research work during 1908-9. 1500 w. Mech Engr—May 21, 1909. No. 5190 A.

The Strength of Raw Hide Gearing. R. Livingstone. Considers methods of calculating the size of pinion required for a given power and speed. 1500 w. Elect'n, Lond—March 19, 1909. No. 3604 A.

Machine-Cut Double-Helical Gears. Perry C. Day. Explains the advantages of this type of gear and the methods of cut-

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ting and applications. Ills. 4000 w. Am Mach—Vol. 32. No. 32. No. 7008.

Experimental Spur-Wheel Reduction-Gear for High-Speed Steam-Turbines. Illustrated description of a reducing gear to be applied to marine turbines, constructed for George Westinghouse from the designs of Rear-Admiral George W. Melville and John H. Macalpine. 5000 w. Engng—Sept. 17, 1909. No. 8123 A.

Ferguson's Mechanical Paradox. Illustrated description of an ingenious train of gears invented in 1750. 2000 w. Sci Am Sup—July 24, 1909. No. 6625.

See also same title, under AUTOMOBILES.

Graphical Charts.

Isometric Plotting of Graphical Charts. Guido H. Marx. Explains the principle of isometric projection, illustrating by example. 1500 w. Am Mach—Vol. 31. No. 46. No. 220.

Curves for Engineering Calculations. J. M. Spitzglass. Describes a method of plotting and combining curves, explaining their value as time savers. 2500 w. Power—Aug. 10, 1909. No. 6993.

Graphics.

Centres of Gravity and Moments of Inertia by Christian Nehl's Graphic Method. A short review of Nehl's method, with suggestions for simplification and also a few theoretical applications. 1100 w. Cornell Civ Engr—Oct., 1909. No. 8841 C.

Gyroscope.

The Gyroscope and Its Applications (Studio sul Giroscopio e le sue Applicazioni). L. Silla. An exhaustive discussion. Ills. Serial. 1st part. 9000 w. Ann d Soc d Ing e d Arch Ital—Sept. 1, 1909. No. 8636 F.

Gyrostats.

Principles and Applications of the Gyrostat. Horace B. McCabe. Describes the mechanism and actions of gyrostats, giving general rules governing their action. Ills. 2200 w. Am Mach—Vol. 32. No. 37. No. 7769.

A Study of Gyroscopic Phenomena (Etude sur le Phénomène gyroscopique). M. Astier. Mathematical. Ills. 4500 w. Rev de Mécan—Aug., 1909. No. 7926 E + F.

Hobs.

How Many Gashes Should a Hob Have? Ralph E. Flanders. Studies the imperfect generating action of the hob, giving diagrams for finding the number of cuts

MACHINE ELEMENTS AND DESIGN

Kinematics

per linear pitch, and discussing the effect of the number of teeth in the wheel. 2000 w. Mach, N Y—Jan., 1909. No. 1550 C.

Impact.

The Impact of Elastic Solid Bodies. A study of the physical and mechanical principles involved in the theory of impact of elastic solids. 4000 w. Locomotive—July, 1909. No. 7508.

Joints.

A Note on Ball-and-Socket Joints. An investigation of the limiting proportions of such joints. 600 w. Engr, Lond—Nov. 13, 1908. No. 453 A.

Journal Bearings.

Relation Between Rotative Speed and Bearing Surface of Journal Bearings. A. M. Bennett. Gives formula and graphical chart for bearings under a steady load. 900 w. Am Mach—Vol. 32. No. 24. No. 5571.

Journal Loads.

Journal Loads in Geared Mechanisms. John Edgar. Points out modifications that must be made in the general theory that the gear-tooth pressure is transmitted directly to the journal bearings in inverse proportion to their distance from the gear. Diagrams. 2500 w. Am Mach—Vol. 32. No. 21. No. 5016.

Journals.

Friction and Bearing Pressures of Journals. W. H. Scott. A review of theories and experiments. 2500 w. Mech Wld—Oct. 23, 1908. No. 68 A.

On Journal Friction. H. P. Jordan. A critical discussion of assumptions in a paper by W. H. Scott. 2000 w. Mech Wld—Dec. 4, 1908. No. 1016 A.

The True Principles of Mechanics. Sidney A. Reeve. Discusses the present based on Newton's laws. 3000 w. Engr, Lond—Dec. 18, 1908. No. 1376 A.

Keys.

Square Machine Keys. O. V. Thiele. Indicates features worth further investigation. 2500 w. Wis Engr—April, 1909. No. 5688 D.

Kinematics.

Instantaneous Axes and Their Application to the Solution of Problems in Kinetics. A. Spencer-Bower. A mathematical explanation of their utility in the determination of the relative velocities of two or more moving centers. Diagram. 2000 w. Mech Wld—June 25, 1909. Serial, 1st part. No. 6268 A.

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Levers

MACHINE ELEMENTS AND DESIGN

Shafts

The Graphical Design of the Slot and Crank (Der graphische Entwurf der Kurbelschleife). Hans Volkmann. Illustrated mathematical discussion. 2000 w. Zeitschr f Werkzeug—Feb. 15, 1909. No. 3385 D.

Levers.

Rolling Levers (Wälzhebel). Heinrich Holzer. A theoretical study of their design. Ills. 6500 w. Zeitschr d Ver Deutscher Ing—Dec. 19, 1908. No. 2105 D.

Mechanics.

Inertia and Mass. V. Dwelshouvers-Dery. Reviews the theories of modern physicists, and presents arguments to show that it has not been demonstrated that the material mass of bodies is variable. 3500 w. Engng—June 11, 1909. No. 5662 A.

The Work of Recoil. Sir George Greenhill. Explanatory note. 500 w. Engr, Lond—July 16, 1909. No. 6692 A.

Milling Machines.

Cutter-Marks. H. S. Quackenbush. Explains means of facilitating calculations in designing a mill or milling machine so that the depth of these waves will be small. 2000 w. Harvard Engng Jour—Jan, 1909. No. 3196 D.

Pipe Threads.

Standard Practice in Pipe Threads. J. F. Springer. Considers British and American practice, discussing Great Britain's Whitworth thread and the American Briggs thread. 4000 w. Power—Aug. 3, 1909. No. 6820.

Piston Rings.

Design and Manufacture of Piston Rings. Rene M. Petard. Describes current French automobile practice for making theoretically correct rings. Ills. 3500 w. Am Mach—Vol. 32 No. 5. No. 2258.

Presses.

A Note on the Design of Flywheel Presses (Ein Beitrag zur Berechnung der Schwungradpressen). Herr Schlesinger. Mathematical discussion of the design of presses for sheet-metal work. Ills. 7100 w. Zeitschr d Ver Deutscher Ing—Feb. 20, 1909. No. 3567 D.

Reducing Wheels.

The Practical Operation of Reducing Wheels. Hubert E. Collins. Illustrated explanation of parts of certain makes of wheel, with instructions for handling, etc. 2000 w. Power—Nov. 10, 1908. No. 161.

Rivet Holes.

The Influence of Rivet Holes on the Axial Deformation of Steel Rods (Der

Einfluss der Nietlöcher auf die axiale Formänderung gezogener Stäbe). Paul Müller. Mathematical. Ills. 1800 w. Zeitschr d Ver Deutscher Ing—Sept. 4, 1909. No. 8911 D.

Riveted Joints.

Calculating Strength of Riveted Joints; How to Use Riveted Joint Diagrams. S. F. Jeter. Two articles, the first giving elaborate diagrams for calculating the strength of joints and the second simple instructions for and illustrations of their use. Ills. 8500 w. Power—Jan. 5, 1909. (Special No.) No. 1482 D.

Notes on Strength of Rivetted Joints. H. S. Jeffery. Aims to show the real need of considering the factor of safety in the calculation of the strength of boilers. 8000 w. Boiler Maker—Oct., 1909. No. 8379.

The Strength of Riveted Joints. Describes the tests made by M. C. Tremont. 3000 w. Builder—Sept. 18, 1909. No. 8103 A.

The Strength of Rivetted Joints (De la Résistance des Pièces rivées). Ch. Fremont. A report of extended researches. Ills. 16800 w. Bul Soc d'En-cour—April, 1909. No. 4866 G.

Rivetting Tests (Nietversuche). Results obtained by the German Bridge and Steel-Construction Company. Ills. 2200 w. Stahl u Eisen—June 16, 1909. No. 6566 D.

See also Boiler Design, under STEAM ENGINEERING.

Rope Drums.

Proportions of Rope Drums Without Mathematics. George E. Barrett. Gives a diagram and explains its use. 500 w. Am Mach—Vol. 31. No. 52. No. 1277.

Screw Jacks.

The Design of a 20-Ton Screw Jack. Drawings and Calculations. 500 w. Prac Engr—Oct. 30, 1908. No. 180 A.

Screw Threads.

The Elimination of the V-Thread. Discusses the adoption of the United States standard by tap and die makers. 1800 w. Ir Age—Feb. 25, 1909. No. 2746.

Interchangeability and Methods of Securing it in Screw-Threads. H. F. Donaldson. Lecture delivered at the graduates meeting of the Inst. of Mech. Engrs. Considers the difficulties and means of overcoming them. 4000 w. Engng—Feb. 12, 1909. Serial. 1st part. No. 2593 A.

Shafts.

Some Problems in Shaft Design, with a Graphic Method of Solution. Gives a

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Shocks

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problem and a demonstration of a graphic method for its solution. 1500 w. *Prac Engr*—April 30, 1909. No. 4605 A.

The Calculation of Vibration and Whirling Speeds. Arthur Morley. A Mathematical article indicating extension of results obtained to the more complex cases which occur in practice. 2000 w. *Engng*—July 30, 1909. Serial, 1st part. No. 6984 A.

Shocks.

Stresses Produced by Shocks. A. P. Elftoft. Aims to give a clearer understanding of the principles involved in stresses produced by shocks. 1400 w. *Mach*, N Y—Oct., 1909. No. 8280 C.

Slide Rules.

How to Use the Slide Rule. Frederic R. Honey. Explains the principle of this invention for rapid computations, and some useful applications. 1200 w. *Sci Am*—Dec. 19, 1908. No. 1231.

The Slide Rule and Logarithm Chart. O. B. Poore. Discusses the relations and the possible application of the chart and rule to engineering problems. 1500 w. *Minn Engr*—May, 1909. No. 5563 C.

A Duplex Slide-Rule with Log-Log Scales for Power and Root-Calculations. Explains an instrument which will simplify exponential calculations. Ills. 3500 w. *Eng News*—July 8, 1909. No. 6226.

A Slide Rule for Calculating Helical Springs. Winslow H. Herschel. An explanation of the use of a special rule resulting in saving of time in making calculations. 2800 w. *Harvard Engng Jour*—June, 1909. No. 5992 D.

The "Eichhorn" Trigonometric Slide Rule. Illustrated description of a new slide rule intended for the solution of triangles. 800 w. *Am Mach*—Vol. 31. No. 49. No. 771.

Speed Changing.

A Variable Speed Gear. Arthur W. Jones. Illustrated description of an interesting gear designed for the bicycle. 1200 w. *Am Mach*—Vol. 32. No. 27. No. 6211.

Reversing and Speed Changing Devices (*Quelques Changements de Marche et de Vitesse*). A review of recent inventions in this field. Ills. 6000 w. *Rev de Mécan*—May, 1909. No. 5708 E + F.

See also Gear Boxes, under MACHINE ELEMENTS AND DESIGN.

Speed Variation.

See Transmissions, under AUTOMOBILES; and Electric Driving, under POWER AND TRANSMISSION.

Springs.

Spring Formulae Simplified. Chester B. Albree. An attempt to simplify existing formulae and to render the solution of helical spring problems easy for anyone having standard tables of areas and decimal equivalents at hand. General discussion. 4000 w. *Pro Engrs' Soc of W Penn*—Nov., 1908. No. 780 D.

Helical Springs. Henry L. Hanson. Gives tables showing the greatest allowable pressure or load in pounds, and the corresponding compression or deflection in inches per coil of helical springs of various sizes, with examples and explanations. 1000 w. Supplement. *Mach*, N Y—Jan., 1909. No. 1551 C.

The Deflection of Rotating Springs (*Die Durchbiegung rotierender Schraubenfedern*). M. Tolle. A mathematical discussion. Ills. 3200 w. *Zeitschr d Ver Deutscher Ing*—Dec. 12, 1908. No. 2101 D.

A Study of Cylindrical Spiral Springs (*Etude sur le Ressort à Boudin*). M. Astier. Mathematical. Ills. 3000 w. *Rev de Mécan*—March, 1909. No. 4222 E + F.

A Graphical Logarithmic Chart for the Design of Springs (*Logarithmische zeichnerische Tafel zur Federberechnung*). Victor Fischer. Explains the construction and use of the chart. Ills. 1800 w. *Zeitschr d Ver Deutscher Ing*—July 3, 1909. No. 7469 D.

See also Slide Rules, under MACHINE ELEMENTS AND DESIGN.

Strength of Materials.

Working Stress. F. W. Wright. Gives information based on Wohler's experiments, also results of other experiments, and formulae used. 1500 w. *Mech Wld*—Feb. 12, 1909. Serial. 1st part. No. 2588 A.

Problems in the Strength of Materials Solved by Elementary Mathematics in the Night-Courses of the Institute. Lucien E. Picolet. Discusses representative problems. 2000 w. *Jour Fr Inst*—Feb., 1909. No. 2741 D.

The Strength of Pipes and Cylinders. C. A. Smith. Shows how the new interpretation of Guest's law affects the theory of tubes and thick cylinders. 1000 w. *Engng*—March 5, 1909. No. 3170 A.

Investigations of Transverse Elasticity and Shearing Strength (*Versuche über die Schubelastizität und -festigkeit*). M. Grübler. A report of elaborate tests. Ills. 5500 w. *Zeitschr d Ver Deutscher Ing*—March 20, 1909. No. 4294 D.

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Stresses

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Bending Machines

Stresses.

Stress Disturbance by Grooves (Ueber die Spannungsstörungen durch Kerben und Stellen und über die Spannungsverteilung in Verbundkörpern). Alfons Leon. A mathematical paper on the effects on stress distribution of various types of grooves. Ills. Serial. 1st part. 5500 w. Oest Wochenschr f d Oeffent Baudienst—Oct. 24, 1908. No. 578 D.

Stuffing Boxes.

A New High-Pressure Packing for Rotating Shafts (Eine neue Hochdruckdichtung für rotierende Wellen). Alfred Vontobel. Illustrated description of a type especially adapted for use on turbines. 1600 w. Zeitschr f d Gesamte Turbinenwesen—Nov. 10, 1908. No. 1161 D.

Thrust Bearings.

Thrust Bearings. G. B. Woodruff. Read at the Inst. of Marine Engrs. Specially describing a new form of thrust bearing said to give results, as regards load-carrying capacity and low friction loss, similar to those of a perfectly lubricated journal bearing. Ills. 3500 w. Can Engr—Jan. 1, 1909. No. 1399.

Graphical Solution of Thrust-Bearing Problems. George E. Barrett. 700 w. Int Marine Engng—Oct., 1909. No. 8326 C.

Torsion.

The Behavior of Ductile Material Under Torsional Strain. C. E. Larard. Read before the Engineering Section of the British Association at Winnipeg. A report of research experiments. Ills. 4500 w. Engng—Sept. 3, 1909. Serial. 1st part. No. 7750 A.

The Theory of Torsion as Applied to Rectangular Prismatic Rods (Zur Theorie der Torsion rechteckig-prismatischer Stäbe). Rudolf Goetzke. Mathematical. Ills. 5000 w. Zeitschr d Ver Deutscher Ing—June 12, 1909. No. 6724 D.

Wedges.

Friction and Abrasion Tests on Steel Wedges. J. S. Macgregor. A report of test made at Columbia Univ. testing laboratory on Hawk brand hardened-steel wedges. 1800 w. Am Mach—Vol. 32. No. 25. No. 5861.

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Aluminium Castings.

Production of Aluminum Castings. Illustrates and describes the working of this metal in the foundry. 2500 w. Foundry—Dec., 1908. No. 753.

Some Notes on Making Aluminum Castings in Green Sand Molds. Directions for the aluminum mixture, melting, molding, etc. 2500 w. Brass Wld—Aug., 1909. No. 7135.

Annealing.

Annealing High-Speed Steel. O. M. Becker. Detailed discussion of methods. 1500 w. Am Mach—Vol. 32. No. 16. No. 4107.

See also Pyrometry, under MEASUREMENT.

Assembling.

Elements of Assembling Operations. Alfred Spangenberg. Considers methods of assembling that will ensure accuracy, economy, and standardization. Ills. 4000 w. Mach, N Y—Sept., 1909. No. 7501 C.

Assembling Machine Tool Units. Alfred Spangenberg. An illustrated consideration of concrete examples, applying principles set forth in a previous article.

4000 w. Mach, N Y—Oct., 1909. No. 8284 C.

Efficient System for the Rapid Assembling of Motor Cars. Harold Whiting Slauson. Describes the assembling rooms of the Chalmers-Detroit Motor Car Co. Ills. 1800 w. Mach, N Y—Oct., 1909. No. 8283 C.

Automatic Machinery.

Automatic Metal Bottle Cap Machinery. Illustrated description of an automatic equipment for the rapid production of a two-piece bottle-cap. 1500 w. Ir Age—Jan. 7, 1909. No. 1492.

Comparison of Power Efficiency—No. 2 and No. 2-G B & S Automatic Screw Machines. A report of tests. Ills. 1200 w. Am Mach—Vol. 32. No. 26. No. 6096.

Automatic Machines.

See Lathes, under MACHINE WORKS AND FOUNDRIES.

Bending Machines.

The Caskey Hydro-Pneumatic Bending Machine. C. M. Hamersly. Illustrated description. 800 w. Am Mach—Vol. 32. No. 12. No. 3488.

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Blacksmith Shops

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Blacksmith Shops.

Suggestions for a Model Blacksmith Shop. James Cran. Plans and description of building and arrangements. 4000 w. Mach, N Y—Oct., 1909. No. 8282 C.

Tools for Increasing Production in Blacksmith Shops. James Cran. Illustrates and describes various useful appliances. 2000 w. Mach, N Y—Nov., 1908. No. 35 C.

Anvils and Forges. James Cran. Discusses points relating to blacksmith shop equipment. Ills. 2000 w. Mach, N Y—May, 1909. No. 4428 C.

Notes on Smithwork. The present number deals with bending iron. Ills. 1600 w. Mech Wld—Sept. 3, 1909. Serial. 1st part. No. 7745 A.

Boiler Making.

International Master Boiler Makers' Association. Account of proceedings of Annual Convention at Louisville, Ky., with abstracts of papers and discussion. Ills. 21000 w. Boiler Maker—June, 1909. No. 5439.

Standardizing of Pipe Flanges for Boilers and Templets for Drilling Same. James Crombie. Abstract of report presented to International Boiler Makers Ass'n, which describes and discusses existing standards. 2300 w. Boiler Maker—June, 1909. No. 5455.

Lay Out of a Horizontal Return Tubular Boiler 18 Feet Long by 72 Inches Diameter. R. R. Sturgeon. Gives specifications and shows by sketches how a boiler of this type would be laid out in the shop. 2000 w. Boiler Maker—Feb., 1909. No. 2319.

A Device for Setting Boiler Tubes (Un Appareil à sertir les Tubes de Chaudières). E. Sauvage. Describes a method of setting tubes devised by M. Gallon. Ills. 3200 w. Bul Soc d'Encour—Feb., 1909. No. 4215 G.

The Manufacture of Sectional Boilers for Central Heating Plants (Fabrikation von gusseisernen Gliederkesseln für Zentralheizungen). Frz. Kerth. Illustrated description of method. Serial, 1st part. 1500 w. Giesserei-Zeit—April 1, 1909. No. 4863 D.

See also Welding, under MACHINE WORKS AND FOUNDRIES.

Bolt Making.

An Up-Setting Machine for Bolts, Rivets, etc. (Machine à Refouler pour Boulons, Rivets, etc.). Illustrated detailed description of an automatic machine for making bolts and rivets from bar iron.

2000 w. Serial. 2 parts. Métallurgie—Sept. 22 and 29, 1909. No. 8625 each D.

Boring.

Boring a Connecting-Rod End Brass in a Jig. Henry Munro. Shows a method requiring but three operations. Ills. 1000 w. Am Mach—Vol. 31. No. 51. No. 1071.

Special Boring Fixtures for Bench Lathe Heads. Describes and illustrates work on an accurately constructed bench machine. 1000 w. Am Mach—Vol. 32. No. 6. No. 2460.

Boring Bars and Heads. Lucien L. Haas. Description, with illustrations of twenty designs. 1500 w. Mach, N Y—May, 1909. No. 4425 C.

Boring Machines.

A Large, Vertical, Cylinder Boring Machine. Philip Bellows. Describes a special design, equipped with friction drive. Ills. 3000 w. Am Mach—Vol. 31. No. 46. No. 219.

8-Inch-Spindle Horizontal Boring, Milling, Drilling, Tapping, and Studding Machine. Illustrated description of the machine and its operation. 700 w. Engng—Jan. 29, 1909. No. 2360 A.

Brass Founding.

Notes on Brass Melting. Charles T. Bragg. Discusses the causes for variations of composition of an alloy while in the furnace, and the making of alloys of standard composition. 3000 w. Am Brass Found Assn—May 18, 1909. No. 5112 N.

The Manufacture of Red Brass Ingot; Its Uses and Advantages. W. M. Corse. An account of the manufacture of high-grade ingot brass. 2500 w. Am Brass Found Assn—May 18, 1909. No. 5114 N.

Melting Brass Turnings in the Oil Furnace. Edward H. McVeen. Paper read before the American Brass Founders' Ass'n describing the use of the oil furnace for making light and medium heavy brass castings. 650 w. Foundry—June, 1909. No. 5360.

The Art of Casting Manganese-Bronze, and the Manner in Which the Difficulties Are Overcome. Illustrated article with directions for securing the best results. 2500 w. Brass Wld—Feb., 1909. No. 2721.

The "Burning" of Copper During Melting and Its Effect on Castings. Explains the right method and the care needed. Ills. 700 w. Brass Wld—Aug., 1909. No. 7136.

Notes on the Care of Crucible Furnaces and Character of Fire Brick to Be Used in Them. Considers the quality of the fire-brick, and the necessary requirements

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Brass Founding

when used in lining crucible furnaces. Ills. 1800 w. Brass Wld—Sept., 1909. No. 7877.

The Economy of Skimming Brass Into Water. A. L. Haasis. Describes the Metal Dross Economy process, and the saving effected. 1000 w. Brass Wld—March, 1909. No. 3443.

The Use of the Liver of Sulphur Dip, and Its Application in the Production of Various Finishes on Metals. Illustrates and describes its action and various finishes produced. 2000 w. Brass Wld—April, 1909. No. 4109.

The Production of the "Barbedienne" or Dark Brown Finish on Metals. Explains how to produce this finish. 1000 w. Brass Wld—May, 1909. No. 4748.

Observations on the "Spotting-Out" of Lacquered Work, and the Cleaning of Metal for Lacquering. W. A. Jones. Remarks on troubles encountered and their remedies. 2000 w. Brass Wld—Dec., 1908. No. 1324.

Repairing Broken Brass Castings. Ethan Viall. Illustrates and describes methods used in the brass foundry of the C. & A. railroad, at Bloomington, Ill. 800 w. Foundry—July, 1909. No. 6124.

Cost of Manufacturing Valves, Hydrants, and Brass Goods in Municipal Shops for the Boston Water Works. Gives results of a recent investigation of shops operated by the city. 2500 w. Engng-Con—Sept. 29, 1909. No. 8232.

Ornamental Brass Register Parts. Illustrates and describes methods of National Cash Register Co. in producing ornamental brass castings. 3000 w. Foundry—Aug., 1909. No. 6812.

The Ohio Brass Company's Plant at Mansfield, Ohio. Description of foundries and other buildings of a modern plant for manufacturing brass specialties. Ills. 3500 w. Indus Engng—Oct. 15, 1909. No. 8574 B.

See also Alloys, under MATERIALS FOR CONSTRUCTION; Alloys, under MACHINE WORKS AND FOUNDRIES; and Cost Systems, under INDUSTRIAL ECONOMY.

Brazing.

Brazing Cast Iron and Other Metals. F. N. Blake. Practical notes. 800 w. Prac Engr—Oct. 23, 1908. No. 66 A.

See also Welding, under MACHINE WORKS AND FOUNDRIES.

Bronze Founding.

The Casting of Bronze Statues. Snowden B. Redfield. Describes the intricate core work necessary. 3000 w. Am Mach—Vol. 32. No. 22. No. 5208.

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Castings

Casting a Colossal Bronze Statue. Illustrations and information concerning the monument to King Victor Emanuel II in Rome, Italy. 1000 w. Sci Am Sup—July 10, 1909. No. 6243.

Buildings.

See Factories, under CIVIL ENGINEERING, CONSTRUCTION.

Button Making.

Dies for Covering Buttons. Charles Weslow. Illustrates and describes dies and tools for manufacturing cloth buttons. 1500 w. Mach, N Y—Sept., 1909. No. 7503 C.

Can Making.

The Manufacture of Tin Cans. H. M. Lane. Illustrates and describes the machinery and processes developed by the Sherwin-Williams Co., Cleveland, O. 2000 w. Ir Age—Sept. 2, 1909. No. 7514.

Making Solderless Cans for Food Products. Ralph E. Flanders. Illustrates and describes methods and machinery employed at the Max Ams Machine Co.'s works. 2000 w. Mach, N Y—Sept., 1909. No. 7500 C.

Case Hardening.

Experiments on the Case Hardening of Steel by Gases. J. C. Olsen and John S. Weiffenback. Read at the Brooklyn meeting of the Am. Inst. of Chem. Engrs. (Abstract.) Carbon-monoxide found the best gas for the purpose. 1500 w. Ir Age—July 8, 1909. No. 6217.

Case Hardening (Ueber Zementieren). B. Neumann. A review of recent researches and progress. Ills. Serial. 1st part. 1300 w. Giesserei-Zeit—Jan. 1, 1909. No. 2680 D.

The Cementation of Iron and its Alloys by Carbon Monoxide (Sur la Cémentation du Fer et de ses Alliages par l'Oxyde de Carbone). M. G. Charpy. Suggests a new method for case hardening. 6500 w. Rev de Métal—May, 1909. No. 5721 E + F.

Castings.

Correct Metal for Castings. Almon Emrie. Illustrated description of a method for obtaining the right kind of metal from the cupola, in the correct amounts. 700 w. Am Mach—Vol. 32, No. 40. No. 8391.

The Scientific Mixing of Iron for Castings. George Hailstone. Abstract of paper read before the Staffordshire Iron and Steel Inst. Discusses the scientific organization involved in the production of molten iron for castings. 5000 w. Ir &

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Coal Trade Rev—Dec. 24, 1908. No. 1546 A.

Elementary Notes on Iron with a Few Side Lights on Malleable Castings. C. A. Swallow. 2000 w. Foundry—Nov., 1908. No. 59.

Figuring the Weight of Cast Steel. R. A. Bull. Explains a method of finding the weight of steel castings. 1200 w. Foundry—Nov., 1903. No. 56.

New Method of Making Steel Castings. E. F. Lake. An illustrated article giving information of the kinds of steel used and intricate shapes cast by a shop in Germany. 1500 w. Am Mach—Vol. 31, No. 53. No. 1403.

Manufacture of Steel Castings in Small Quantities. Arthur Simonson. Read before the Phila. Found. Assn. Using a converter of 1000 pounds capacity, by the new Tropenas system. Ills. 2500 w. Ir Trd Rev—Jan. 14, 1909. No. 1753.

The Manufacture of Steel Castings in Small Quantities. Arthur Simonson. Read before the Phila. Found. Assn. Describes the manufacture with a converter of 1000-lbs. capacity, by the new Tropenas system. Ills. 4500 w. Foundry—Feb., 1909. No. 2254.

The Relation of Engineering Design to Foundry Manufacture of Cast Iron Forms. W. R. Conrad. Calls attention to the manner in which iron will act in being cast, and its relation to design. 1500 w. Pro Am W-Wks Assn—1908. No. 5941 N.

Cost of Steel Making in Foundries. Bradley Stoughton. Read before the Am. Found. Assn; Considers the future relation of electric steel making processes to present methods. 2500 w. Ir Trd Rev—June 10, 1909. No. 5365.

The Production of Sound Castings. Robert Buchanan. A lecture on the materials and methods necessary for the production of perfect castings. 10500 w. Jour. W of Scotland Ir & Steel Inst—Jan., 1909. No. 4318 N.

Open-Hearth Methods for Steel Castings. W. M. Carr. With remarks on the small open-hearth furnace. Ills. 2200 w. Am Found Assn—May 18, 1909. No. 5123 N.

The Air-Furnace Process of Preparing White Cast-Iron for the Malleablizing Process. Henry M. Howe and Enrique Touceda. A report of investigations. 2000 w. Bul Am Inst of Min Engrs—March, 1909. No. 3473 F.

Casting Internal Screw Threads. Walter J. May. Suggestions for such work.

Ills. 600 w. Prac Engr—May 14, 1909. No. 4949 A.

Thin Cores in Metal Casting. Walter J. May. Suggestions for cases where thin cores are desirable. 600 w. Prac Engr—Aug. 13, 1909. No. 7318 A.

Making Malleable Castings. An illustrated review of recent developments, referring to papers read before the American and British foundry associations. 2500 w. Ir & Coal Trds Rev—June 25, 1909. No. 6287 A.

Steel Castings. A general discussion. Ills. 7000 w. Pro Engrs' Soc of W Penn—July, 1909. No. 6746 D.

Steel Castings. Otto Beckmann. Explains the system of producing various types of castings. Ills. 2500 w. Ir & Coal Trds Rev—May 14, 1909. No. 5141 A.

The Prevention of Waster Castings. Joseph Horner. A discussion of the causes of defective castings. Ills. 2500 w. Foundry—Dec., 1908. No. 755.

Faulty Castings and Their Prevention. Walter J. May. Suggests methods of reducing the number of waste castings. 1400 w. Mech Wld—March 12, 1909. No. 3413 A.

Warped or Distorted Castings—Methods of Prevention. Jabez Nall. Suggestions for prevention and for treatment. Ills. 2000 w. Foundry—Dec., 1908. No. 756.

Defective Castings. G. E. Lines. Discusses the work of the different departments of the foundry showing that the responsibility lies with no one department. Ills. 1800 w. Mech Wld—Jan. 1, 1909. Serial, 1st part. No. 1528 A.

Sponginess on the Upper Surface of Castings. D. Wilkinson, Junr. Describes this and other defects in castings, considering the causes and remedies. 2000 w. Ir & Coal Trds Rev—Jan. 8, 1909. No. 1830 A.

Sponginess on the Upper Surface of Castings. D. Wilkinson, Jr. Discusses the causes and the suggestions that have been offered for overcoming the difficulty, but states the problem is not solved. 3000 w. Mech Wld—Jan. 29, 1909. No. 2354 A.

Interesting Tests of Steel Castings. Illustrates and describes a number of tests. 1600 w. Foundry—March, 1909. No. 2944.

Steel Foundry Shrinkage Problems. R. A. Bull. A discussion of causes of shrinkage and methods of overcoming them. 4000 w. Foundry—Jan., 1909. No. 1613.

Steel Foundry Shrinkage Problems. R. A. Bull. Discusses the causes of shrinkage in steel castings and methods of over-

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coming this difficulty. 3500 w. Ir Trd Rev—Feb. 25, 1909. No. 2770.

Interesting Tests of Steel Castings. An illustrated account of a ballistic test of a cast steel cylinder to detect internal strains, and of hydrostatic tests of high pressure values. 1200 w. Ir Trd Rev—April 29, 1909. No. 4350.

The Practical Value of Chemical Standards for Iron Castings. John Jermain Porter. Discusses the importance of chemical composition. 2000 w. Am Found Assn—May 18, 1909. No. 5125 N.

The Practical Value of Chemical Standards for Iron Castings. John J. Porter. Read at meeting of Am. Found. Assn. Suggests investigations that would be of benefit to the foundry industry. 2200 w. Ir Trd Rev—May 20, 1909. No. 4796.

Casting Printing Press Cylinders. A. Manchester. Shows the manner of molding and casting. Ills. 1200 w. Am Mach—Vol. 31. No. 47. No. 363.

Casting Steam Engine Cylinders. N. W. Shed. Methods of moulding and casting various types of cylinders are illustrated and described. 2200 w. Foundry—May, 1909. No. 4499.

The Production of Steam Cylinder Castings. Herbert M. Ramp. Discusses some of the essentials of materials and workmanship to produce successful castings. 2500 w. Foundry—Aug., 1909. No. 6815.

Molding and Casting 90-Ton Frames. Illustrated description of method of making large engine beds for gas engines. 2200 w. Foundry—May, 1909. No. 4496.

The Production of Castings for Agricultural Machinery (Die Herstellung der Gussstücke für den landwirtschaftlichen Maschinenbau). R. Schmidt. Outlines the special problems of this class of work. Ills. Serial, 1st part. 1500 w. Giesserei-Zeit—May 1, 1909. No. 5762 D.

Molding and Casting of Radiators (Formen und Giessen von Radiatoren und Rippenheizkörpern in der Zentralheizung). Franz Kerth. A description of modern practice. Ills. Serial, 1st part. 2300 w. Giesserei-Zeit—July 15, 1909. No. 7266 D.

See also Cast Iron, under MATERIALS OF CONSTRUCTION; Brass Foundry, Converters; and Cleaning, under MACHINE WORKS AND FOUNDRIES; Electro-Metallurgy, and Steel Making, under MINING AND METALLURGY, IRON AND STEEL.

Chain Making.

Chains Without Transverse Welds. Il-

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lustrated description of a new method for the manufacture of chains of every kind and size, invented by Alfred Marion, of Brussels. 1200 w. Engr, Lond—March 26, 1909. Serial. 1st part. No. 3792 A.

Chains of Seamless Rolled or Pressed Links (Ueber nahtlose Walz- und Pressketten). Otto Klatte. Discusses their manufacture, strength, etc. Ills. 2500 w. Stahl u Eisen—Jan. 20, 1909. No. 2664 D.

See also Forging, under MACHINE WORKS AND FOUNDRIES.

Cleaning.

A New Process for Cleaning Iron with Recovery of Sulphate of Iron (Note sur un Procédé nouveau pour le Décapage du Fer et la Récupération du Sulfate de Fer). Georges Charpy. Brief description, read before the Congress of Applied Chemistry. Ills. 1200 w. Rev de Métal—June, 1909. No. 6509 E + F.

Researches on the Cleaning of Metals (Neuere Untersuchungen über das Beizen). Julius Grünwald. Results of extended investigations on metal-cleaning baths of various compositions. Ills. 3800 w. Stahl u Eisen—April 14, 1909. No. 4855 D.

Straight- and Curved-Track Dipping Machines (Geradbahn- und Kreisbahn-Beizmaschinen). U. Lohse. Describes various machines for dipping sheets in cleaning solutions. Ills. Serial, 1st part. 2800 w. Stahl u Eisen—June 16, 1909. No. 6565 D.

Modern Plants for Cleaning Castings (Ueber moderne Gussputzanlagen). W. Caspary. Discusses the arrangement and equipment of the cleaning room and its relation to other parts of the plant. Ills. 2200 w. Stahl u Eisen—June 2, 1909. No. 6561 D.

Converters.

The Side-Blow Converter for Steel Castings, and Its Operation. J. S. Whitehouse. Reviews the difficulties of this process, explaining the causes of failures. 1200 w. Am Found Assn—May 18, 1909. No. 5116 N.

The Small Bessemer Converter. P. Eyermann. Detailed description of its use in the manufacture of steel castings in Belgium. Ills. 1200 w. Ir Age—June 24, 1909. No. 5858.

A Baby Converter Steel Foundry. Illustrated description of the construction, equipment, and operation of a small Tropenas converter steel casting plant at Newcastle, Delaware. 2500 w. Foundry—July, 1909. No. 6122.

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Small Converter Practice (Das Kleinbessemerer-Verfahren). Herr Hutmacher. Discusses the use of the bessemer converter in the steel foundry. Ills. 1300 w. *Giesserei-Zeit*—Aug. 15, 1909. No. 7960 D.

Core Making.

Striking Up Cores in Loam. Walter J. May. Describes methods. Ills. 1000 w. *Prac Engr*—Oct. 23, 1908. No. 65 A.

Cores and Core Making. F. R. Cheney. Discusses core binders and making cores. 1500 w. *Am Found Assn*—May 18, 1909. No. 5126 N.

Cores.

Method of Ascertaining the Lifting Pressure of Molten Metal on Cores. F. Webster. Experimental study. Ills. 1200 w. *Foundry*—Nov., 1908. No. 54.

Brass Valve Core Shop Practice. Illustrated description of highly specialized moulding methods. 2000 w. *Foundry*—May, 1909. No. 4501.

Cupola Charging.

Old and New Methods of Cupola Charging (Alte und neue Kupolofenbeschickung). Th. Ehrhardt. Illustrates and describes a number of methods and devices. 3000 w. *Stahl u Eisen*—Jan. 13, 1909. No. 2659 D.

Cupola Design.

The Determination of the Dimensions of Cupolas and the Osann Theory (Berechnung von Kupolofenabmessungen und die Theorie Osann). Carl Rein. An explanation of the Osann theory. Ills. Serial. 1st part. 2000 w. *Giesserei-Zeit*—Jan. 1, 1909. No. 2681 D.

Cupola Gases.

The Mass and Chemical Composition of Cupola Waste Gases (Menge und chemische Zusammensetzung der Kupolofengichtgase). Georg Buzek. A discussion of the effect of the air supply. 2100 w. *Stahl u Eisen*—May 12, 1909. No. 5748 D.

Cupola Lining.

Cupola Linings (Das Kupolofenfutter). Discusses the importance of careful selection of materials, the chemical principles involved, etc. 1700 w. *Stahl u Eisen*—Feb. 24, 1909. No. 3365 D.

The Destruction of Cupola Linings (Wie kleidet man Kupolöfen aus?). Otto Beckmann. Discusses the effect of the lining on the working of the cupola, materials, etc. Ills. 1900 w. *Giesserei-Zeit*—Feb. 15, 1909. No. 3373 D.

Cupola Practice.

Modern Cupola Practice. John C. Knoeppel. Suggestions for the management of the cupola. 2500 w. *Am Found Assn*—May 18, 1909. No. 5117 N.

Continuous Melting. Richard H. Probert. Explains the advantages of the continuous melting process. 2000 w. *Am Found Assn*—May 18, 1909. No. 5121 N.

Continuous Melting in the Foundry Cupola. Richard H. Probert. Read before the *Am. Found. Assn.* Describes cupola details and methods used. 2000 w. *Ir Age*—May 20, 1909. No. 4766.

The Continuous Running of Cupolas. Walter J. May. Suggestions for this method of working. 1200 w. *Prac Engr*—June 11, 1909. No. 5628 A.

Economy in Cupola Melting. J. W. Henderson. Considers factors of economy involved in the conversion of pig iron, scrap, etc., into good castings. Ills. Discussion. 7000 w. *Pro Engrs' Soc of W Penn*—July, 1909. No. 6745 D.

Bringing Down Iron Soft in the Cupola. Walter J. May. Suggestions for the manipulation of the cupola and related matters. 1200 w. *Mech Wld*—Aug. 13, 1909.—No. 7320 A.

Cupola Air Pressure. Walter J. May. Suggestions for supplying large volumes of air at low pressure over the whole charge. 1400 w. *Prac Engr*—July 23, 1909. No. 6841 A.

Fluxes for Melting Iron. Information regarding the chemical action and influence of fluxes in cupola melting. 2000 w. *Ir & Coal Trds Rev*—Oct. 1, 1909. No. 8957 A.

Mixing Irons for the Cupola (Eisengattierung für den Kupolofen). Leo Hemmer. Discusses the general principles in the proportioning of cupola mixtures. 3500 w. Serial. 2 parts. *Giesserei-Zeit*—Sept. 1 and 15, 1909. No. 8656 each D.

Cupola Operation with Dry and Wet Coke (Betrachtungen über das Kupolofenschmelzen mit trockenem und nassem Koks.) C. Geiger. A report of observations extending over several weeks. Ills. 6000 w. *Stahl u Eisen*—Jan. 13, 1909. No. 2661 D.

Dry versus Wet Coke for the Foundry Cupola. C. Geiger, in *Stahl und Eisen*. Explains the possibility of obtaining more economical results in the cupola with wet coke than with dry. 1500 w. *Ir & Coal Trds Rev*—Feb. 19, 1909. No. 2904 A.

Cupolas.

Latter-Day Cupola Practice. E. E. Riepen. Read before the Detroit Found.

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Cupolas

Assn. Methods of manipulating and operating the melting furnace of the gray iron foundry. 4500 w. Foundry—Dec., 1908. No. 754.

Cupola Practice. M. Albütz. Compares statements in papers by Mr. Bellamy and by Mr. Dalrymple, and also other investigators. 4500 w. Ir & Coal Trds Rev—Dec. 24, 1908. No. 1548 A.

A Suggested Change in Cupola Practice. Richard Moldenke. Read before the Phila. Found. Assn. Describes an improved method of charging, discussing related matters. 3000 w. Foundry—Jan., 1909. No. 1615.

Melting Iron in a Foundry Cupola. Prof. H. McCormack. A report of experimental investigations on heat developed. 2500 w. Elec-Chem & Met Ind—Sept., 1909. No. 7593 C.

Cupola Linings. Walter J. May. Directions for setting fire-bricks in a cupola. Ills. 700 w. Prac Engr—Dec. 11, 1908. No. 1201 A.

The Design of Cupolas (Die Berechnung der Kupolofenabmessungen). Bernhard Osann. Discusses principally air heating and the heating of the fore-hearth. Ills. Serial. 1st part. 4500 w. Stahl u Eisen—Oct. 7, 1908. No. 543 D.

Construction, Smelting Process and Charging of Cupolas (Bau der Kupolöfen, Schmelzvorgang und Begichtung). A. Messerschmitt. A discussion of all branches of cupola practice. Ills. Serial. 1st part. 5600 w. Stahl u Eisen—Aug. 4, 1909. No. 7950 D.

Cutting Metals.

Oxyhydric Process of Cutting Metals. E. F. Lake. Illustrates and describes this method, the apparatus used, and some applications. 3000 w. Am Mach—Vol. 32. No. 25. No. 5860.

Metal-Cutting by Means of Oxygen. Describes this process, illustrating apparatus used and work accomplished. 2200 w. Engng—Aug. 6, 1909. No. 7103 A.

The Resistance of Metals to Cutting by the Removal of Small Chips (Ueber den Schnittwiderstand bei der Bearbeitung der Metall durch Abheben von Spänen). H. Friedrich. Reviews various tests and theories. Ills. 5500 w. Zeitschr d Ver Deutscher Ing—May 29, 1909. No. 5969 D.

See also Welding, under MACHINE WORKS AND FOUNDRIES

Cutting Tools.

An Improved Lathe Tool and Tool-Holder. Describes the recent invention

MACHINE WORKS AND FOUNDRIES

Drilling

of James Hartness. Ills. 4500 w. Mech Engr—June 18, 1909. No. 6034 A.

A Practical Machine Tool System for a Railway Shop. W. J. Eddy. Gives the machine tool chart of the Erie Railroad with explanatory notes. 600 w. R R Age Gaz—March 26, 1909. No. 3520.

Tests of Lathe Tools for Finishing Cuts. W. A. Knight. Gives diagrams obtained by means of a special indicator, with description of tests. Ills. 3000 w. Am Mach—Vol. 32. No. 14. No. 3832.

Relation of Cutting Speed, Feed, Depth of Cut. Edward G. Herbert. Investigates wear in cutting tools, with explanation of Herbert's Cube law. 2500 w. Am Mach—Vol. 32. No. 25. No. 5862.

See also Milling Cutters, under MACHINE WORKS AND FOUNDRIES; Tool Steels, under MATERIALS OF CONSTRUCTION; and Dynamometers, under MEASUREMENT.

Damascening.

A New Process for Damascening, Inlaying, and Blending Metals. Illustrated description of the process and work produced. 1500 w. Sci Am—July 31, 1909. No. 6765.

Dies.

Drawing Dies for Hollow Rivets. Charles Welslow. Illustrated description of the work done. 1200 w. Mach, N Y—Oct., 1909. No. 8290 C.

Drawing-Press Tools.

Press Tools Used in Typewriter Manufacture. Illustrated description of sectional dies employed, and other tools. 1500 w. Am Mach—Vol. 31. No. 52. No. 1279.

Drilling.

Comparisons of Carbon and High-Speed Drills. Reports tests which show that the high-speed drills drilled 57 times as many holes as the carbon drills under the same conditions. 1800 w. Am Mach—Vol. 31. No. 46. No. 222.

High Speed Drilling Tests. George E. Hallenbeck. Gives results of tests made with high speed drills on the Baker high-speed drilling machine. Ills. 1000 w. Ir Age—April 29, 1909. No. 4326.

Countersunk Drilling and Riveting. T. Leonard Bott. Illustrates designs of gages and tools which seem to have overcome the difficulties of this class of work. 1200 w. Mech Wld—May 14, 1909. No. 4952 A.

High Speed Twist Drills. Discusses the use of drills in a railway shop and

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Drilling Machines

gives tables showing the best speeds and feeds for different size drills. 2000 w. *Am & Engr R. R. Jour*—June, 1909. No. 5336 C.

Minimizing the Time of Drilling Operations. Alfred Spangenberg. Analyzes the elements that enter into rapid drilling, pointing out usual defects in methods and processes. 2500 w. *Mach, N Y*—July, 1909. No. 6071 C.

Drilling Machines.

German Portable Electric Drilling Machines. Illustrated description of a machine adapted to many uses. 1500 w. *Am Mach*—Vol. 31. No. 52. No. 1281.

Two Machine Tools. Illustrated detailed descriptions of new designs for a duplex horizontal boring and turning mill, and a duplex four-spindle drilling machine. 1200 w. *Engr, Lond*—April 16, 1909. No. 4306 A.

The Improved Western Radial Drill. Illustrated detailed description. 1500 w. *Ir Age*—June 3, 1909. No. 5222.

26-in. High-Speed All-Geared Drilling Machine. Illustrated description of a British design, embodying the most recent improvements. 700 w. *Engng*—May 28, 1909. No. 5364 A.

Increasing the Efficiency of a Horizontal Drilling, Tapping and Boring Machine. Alfred Spangenberg. Illustrates features recently added. 1200 w. *Mach, N Y*—June, 1909. No. 5175 C.

Combined Slotting and Drilling-Machine. Illustrated description of a heavy machine constructed at the Ernst Schiess works, Dusseldorf. 500 w. *Engng*—Sept. 24, 1909. No. 8362 A.

Drills.

Experiments Upon the Forces Acting on Twist-Drills When Operating on Cast-Iron and Steel. Dempster Smith and R. Poliakoff. A record of experiments made with a double-edged cutting tool in the form of a twist drill. Gives also a brief review of the most important work in this field. Ills. 12600 w. *Inst of Mech Engrs*—March 18, 1909. No. 3615 N.

Enamelling.

Enameled Cast Iron Sanitary Ware. Dillon Underhill. First of a series of articles describing methods of molding, pattern-making, designing, annealing, and enameling. Ills. 3500 w. *Foundry*—March, 1909. Serial. 1st part. No. 2942.

The Production of Welded, Enameled Vessels (Die Herstellung geschweisster emaillierter Behälter). Karl Rietkötter. Describes the plant and process. Ills. 1500

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Forging

w. *Stahl u Eisen*—Aug. 18, 1909. No. 7954 D.

Annealing and Pickling in the Enamelling Industry (Ueber das Glühen und Beizen der fertigen Eisenrohware in der Emailindustrie). Julius Grünwald. A review of modern practice. 2000 w. *Stahl u Eisen*—Jan. 27, 1909. No. 2667 D.

See also Furnaces, under MACHINE WORKS AND FOUNDRIES.

Engraving Machines.

Engraving Dies by Automatic Machinery. Snowden B. Redfield. Illustrated description of these mechanical engraving devices, and the preparations for the work. 3500 w. *Am Mach*—Vol. 32. No. 38. No. 8015.

Etching.

The "Painting-On" Method of Etching Brass Signs and Similar Articles. Illustrated detailed description of the process. 2500 w. *Brass Wld*—Sept., 1909. No. 7878.

Facing Sands.

Facing Sands and Their Use. Walter J. May. From *Eng. Mech. & Wld. of Sci.* How to obtain variations in faces. 1200 w. *Sci Am Sup*—Dec: 5, 1908. No. 820.

File Making.

Making Files in a Modern Plant. Illustrates and describes the methods and machinery used by Henry Disston & Sons, Philadelphia. 1200 w. *Am Mach*—Vol. 31. No. 51. No. 1074.

Files.

An Investigation of the Efficiency of Files. Edward C. Herbert. Describes recent investigations of the relative efficiency of files of various types. Ills. 4000 w. *Am Mach*—Vol. 32. No. 22. No. 5212.

Vernaz Milling Files. Report of the Committee on Science and Arts, of the Franklin Institute, on the milling files invented by Alexis Vernaz of Yverdon, Switzerland. Ills. 1200 w. *Jour Fr Inst*—Sept., 1909. No. 7886 D.

File Testing.

See Tool Steels, under MATERIALS OF CONSTRUCTION.

Forging.

The Making of Large Drop Forgings. E. F. Lake. Illustrates and describes different operations in forging a 400 pound crank shaft. 900 w. *Am Mach*—Vol. 32. No. 5. No. 2256.

The Making of Large Drop Forgings. E. F. Lake. Describes the machines, dies, and steel used, and the operations in forg-

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Forging

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Foundry Equipment

ing a 400-lb. crank shaft. Ills. 1500 w. Am Mach—Vol. 32. No. 15. No. 3940.

Drop Forging. R. E. Bury. Abstract of paper before the Indian Sec. of the Inst. of Mech. Engrs. Considers different methods of die forging, showing the advantages of drop forging. 2500 w. Engr, Lond—March 12, 1909. No. 3428 A.

The Forging of Hooks and Chains. James Cran. Information concerning the diameter and length of material to use for different capacities, methods, etc. Ills. 2000 w. Mach, N Y—April, 1909. No. 3646 C.

See also Steam Hammers, under MACHINE WORKS AND FOUNDRIES.

Forging Hammers.

A New Forging-Hammer and Oil Furnace. Illustrated description of designs by E. S. Brett. 1500 w. Engng—May 14, 1909. No. 4960 A.

The Bliss Compound Pneumatic Forging Hammer. Illustrated description. 1000 w. Ir Age—July 1, 1909. No. 6062.

Forging Presses.

German Friction-Spindle Presses. I. W. Chubb. Illustrated description. 600 w. Am Mach—Vol. 32. No. 4. No. 2138.

Foundries.

European and American Foundries. W. H. Dooley. A comparison of the casting plants of Germany, Belgium, England, and Switzerland with those of the United States. 2500 w. Foundry—Oct., 1909. No. 8294.

Modern Iron Foundry and Materials Yard. Features for facilitating the handling of materials at a large iron foundry in Milwaukee, Wis., are illustrated and described. 1000 w. Am Mach—Vol. 32. No. 27. No. 6209.

A Modern Pacific Coast Foundry. H. Cole Estep. Illustrated description of a new casting plant in Portland, Oregon. 2000 w. Foundry—April, 1909. No. 3732.

The Plant of the Standard Cast Iron Pipe & Foundry Co., Bristol, Pa. Illustrated description of a new plant. 2000 w. Eng Rec—Nov. 28, 1908. No. 698.

Wheel Foundry and Foundry Methods; Norfolk & Western. George L. Fowler. Detailed account of wheel foundry practice at the Roanoke shops. Ills. 3000 w. R R Age Gaz—July 16, 1909. Serial, 1st part. No. 6379.

The Works of the Sandycroft Foundry Company Limited. Illustrated description of remodeled works and the products manufactured, especially the electro-

motors for mining purposes. 2000 w. Col Guard—Oct. 15, 1909. No. 8891 A.

Casting Tramway Crossings. Illustrates and describes a small foundry plant for this purpose at Manchester, Eng. 700 w. Engr, Lond—Jan. 8, 1909. No. 1827 A.

Modern Malleable Iron Foundry Practice (Moderne Tempergiesserei). E. Schoemann. Describes a model foundry in Delstern, Germany. Ills. 2300 w. Stahl u Eisen—April 21, 1909. No. 4858 D.

The Foundry Plant of the Sulzer Brothers in Winterthur (Die Giessereianlagen der Maschinenfabrik Gebrüder Sulzer in Winterthur). Illustrated detailed description of this large works. 3000 w. Stahl u Eisen—July 7, 1909. No. 7257 D.

Foundry Accidents.

Report of the Committee on Prevention of Accidents in Foundries. A discussion of injuries and their remedies. Ills. 3000 w. Am Found Assn—May 18, 1909. No. 5115 N.

The Prevention of Accidents in Foundries. Reports to the American Foundrymen's Assn. of a special committee, of which Thomas D. West was chairman. Suggestions for prevention, safety devices, etc. Ills. 3000 w. Ir Age—July 22, 1909. No. 6602.

Foundry Appliances.

The Improvements in Foundry Tools and Appliances. James F. Hobart. Reviews some of the improvements in tools and methods. 2200 w. Mech Wld—Nov. 6, 1908. No. 304 A.

A Novel Power-Ramming Machine. Describes a machine where sand is conveyed from the heap by an elevator belt to a screw from which it is directed on to a packer belt into the flask. Ills. 1000 w. Foundry—June, 1909. No. 5354.

Foundry Equipment.

Some Considerations on the Use of Electricity in Foundries. J. W. Warr. How electricity can be applied to foundry work, with suggestions as to the best methods to insure efficient working. 3500 w. Elec Rev, Lond—April 16, 1909. No. 4191 A.

The Modern Foundry Plant (Die Anlage moderner Metallgiessereien). Discusses briefly modern foundry equipment and practice. Ills. Serial. 2 parts. 3500 w. Giesserei-Zeit—Aug. 1, 1909. No. 7959, each D.

See also Sand Blast, under MACHINE WORKS AND FOUNDRIES.

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Foundry Furnaces

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Furnaces

Foundry Furnaces.

The Air Required for Foundry Furnaces. Walter J. May. Its effect on the efficiency of fuel, with suggestions for securing the best results. 1500 w. *Prac Engr*—Dec. 4, 1908. No. 1015 A.

The Small Open Hearth Furnace for Steel Castings. W. M. Carr. Illustrates and describes a small stationary open-hearth furnace using liquid fuel, presenting its advantages. 1500 w. *Ir Age*—Feb. 11, 1909. No. 2386.

See also Brass Founding, under MACHINE WORKS AND FOUNDRIES.

Foundry Management.

Problems of a Congested Foundry. An illustrated explanation of how they were solved at the Allegheny plant of the Westinghouse Co. 3500 w. *Foundry*—Jan., 1909. No. 1610.

See also Accounting, Cost Systems and Management, under INDUSTRIAL ECONOMY.

Foundry Materials.

Plumbago in the Foundry. Walter J. May. Its value as a sleeking material, for crucibles, and other uses. 600 w. *Prac Engr*—Jan. 29, 1909. No. 2349 A.

Standardizing Foundry Facings. H. F. Frohman. Suggestions for the more common varieties of foundry facings in use. 1200 w. *Am Found Assn*—May 18, 1909. No. 5119 N.

The Use of Steel Scrap in the Cupola. C. R. McGahey. Hints of use to the foundryman. 1200 w. *Am Found Assn*—May 18, 1909. No. 5120 N.

See also Pig Iron, and Steel Making, MINING AND METALLURGY, IRON AND STEEL.

Foundry Practice.

The Principles of Iron-Foundry: Some Things a Foundryman Should Know. Prof. Humboldt Sexton. The present article deals with the properties of pig iron and how they are modified by various constituents and treatment. Ills. 2500 w. *Prac Engr*—July 23, 1909. Serial, 1st part. No. 6839 A.

The Application of "Rule of Thumb" and Science in the Iron Foundry. Sidney G. Smith. Read before the British Found. Assn. A discussion of foundry methods. 4500 w. *Mech Engr*—Aug. 6, 1909. No. 7094 A.

Chemical Analysis in Relation to Foundry Practice. The present number briefly considers oils, fuel, and water. 1200 w. *Prac Engr*—Oct. 23, 1908. Serial. 1st part. No. 67 A.

The Foundry in Its Relation to Chemical Engineering. James Aston. Briefly considers the improved methods being introduced in foundry practice. 1000 w. *Wis Engr*—June, 1909. No. 5692 D.

A Machine Foundry for Special Work. Illustrates and describes methods pursued in the new plant of the General Electric Co., where molding machines are used exclusively. 2500 w. *Foundry*—Feb., 1909. No. 2252.

Repetition Work in Small Quantities. C. Buchanan. Explains a simple match plate process which can be used economically. 2000 w. *Foundry*—Jan., 1909. No. 1611.

Waste Heat in Foundries. Walter J. May. Shows the waste heat from cupola and crucible furnaces, suggesting ways of utilizing it. 1500 w. *Prac Engr*—Sept. 17, 1909. No. 8115 A.

Method of Obtaining a Uniform Chill in Cast Iron Rolls. Thomas D. West. Read before the Am. Soc. for Test. Mat. Illustrates and describes devices used. 1200 w. *Foundry*—Nov., 1908. No. 57.

The Use of Chills in Iron Founding (*Die Verwendung von Kokillen in der Eisengiesserei*). E. Leber. A general discussion of their uses and applications. Ills. Serial, 1st part. 2000 w. *Stahl u Eisen*—Dec. 2, 1908. No. 1940 D.

Poetry and Prose in Foundry Work (*Poesie und Prosa aus der Giesserei*). J. Leber. Describes principally the methods used in producing large castings. Ills. 2800 w. *Stahl u Eisen*—April 28, 1909. No. 4860 D.

Moulding and Casting (*Formen und Giessen*). G. Weigelin. A discussion of practical means of producing sound castings. Ills. 3200 w. *Stahl u Eisen*—Nov. 18, 1908. No. 1146 D.

Foundry Practice (*Aus der Eisen- und Stahlgießereipraxis*). L. Treuheit. An abstract of a paper giving results of observations and experiments on molding sand, cupola practice and the production of steel castings. Ills. Serial, 1st part. 4300 w. *Stahl u Eisen*—July 7, 1909. No. 7258 D.

See also Castings, Molding Machines, Pattern Making, Patterns, and Sand Blast, under MACHINE WORKS AND FOUNDRIES; and Pyrometry, under MEASUREMENT.

Furnaces.

The Use of Gas for Heating. Illustrates and describes some appliances used in hardening and tempering. 5000 w. *Ind Engng*—Aug. 15, 1909. No. 7179 C.

The Use of Pulverized Coal for Foundry Purposes. Richard K. Meade. Pre-

MECHANICAL ENGINEERING

Furnaces

sents the advantages of this fuel. 2000 w. Am Found Assn—May 18, 1909. No. 5122 N.

Industrial Uses of Gas. Abstract of a paper by E. C. Riley, on applications made by the Great Western Ry. Co. at Swindon, England. Ills. 2000 w. Ir & Coal Trds Rev—Nov. 13, 1908. No. 455 A.

Crucible Furnaces Without Chimneys. Walter J. May. Directions for a crucible furnace with forced draught. Ills. 800 w. Prac Engr—Oct. 1, 1909. No. 8472 A.

The Vaughan-Hughes Heat-Treatment Process Furnaces. Illustrates and describes furnaces for case-hardening, annealing, tempering, etc. 2000 w. Ir & Coal Trd Rev—Sept. 3, 1909. No. 7762 A.

Furnaces to Anneal, Harden and Color. E. F. Lake. Illustrates and describes automatic apparatus and furnaces to anneal and harden metals with gas. 2000 w. Am Mach—Vol. 32. No. 36. No. 7703.

Furnaces for and Methods of Hardening. C. U. Scott. Illustrates a hardening room and its equipment, describing methods of hardening, annealing, tempering, etc. 3500 w. Am Mach—Vol. 32. No. 17. No. 4353.

Notes on Air Furnace Construction for Malleable Castings. W. H. Kane. Gives recommendations relating to this furnace. Ills. 1000 w. Am Found Assn—May 18, 1909. No. 5124 N.

New Hardening Furnaces (Neues über Härteöfen). H. Haedicke. Brief descriptions of furnaces of various types. Ills. Serial, 1st part. 2000 w. Stahl u Eisen—April 28, 1909. No. 4861 D.

Muffle Furnaces for Use in the Enameling and Other Industries (Muffelöfen für Emaillierwerke und andere industrielle Zwecke). Ernst A. Schott. Illustrated description of various types. 2500 w. Serial, 2 parts. Giesserei-Zeit—March 15, and April 1, 1909. No. 4257 each D.

Electrical Conditioning Oven. Henry S. Ellis. Illustrates and describes details of an apparatus for ascertaining the percentage of moisture in any fabric. 1000 w. Elec Engr, Lond—Aug. 6, 1909. No. 7088 A.

Electric Annealing Furnaces for Hardening and Tempering High-Class Tools. John B. C. Kershaw. Explains the advantages of electric heating for this work, and illustrates and describes types of furnaces. 1800 w. Elec Wld—Feb. 18, 1909. No. 2518.

Electric Annealing Furnaces for Hardening and Tempering High Class Tools.

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John B. C. Kershaw. Illustrated descriptions of the three types of furnace now in use for small work. 2500 w. Ir Trd Rev—March 4, 1909. No. 2962.

A New Electrical Hardening Furnace. E. Sabersky and E. Adler. Abstract of a paper before the Faraday Soc. Explains the working principle. 3500 w. Elec Engr, Lond—April 2, 1909. No. 3894 A.

A New Electrical Hardening Furnace. Abstract of a paper by E. Sabersky and E. Adler, read before the Faraday Soc. Illustrated description of a new furnace heated by electricity and intended mainly for hardening steels. 2500 w. Mech Engr—May 14, 1909. No. 4951 A.

Electric Hardening Furnaces. Abstract of paper by Messrs. E. Sabersky and E. Adler, before the Faraday Soc., and of the discussion. Deals with details of the hardening furnace with electrically heated salt bath. 2500 w. Elec Chem & Met Ind—May, 1909. No. 4507 C.

The Regenerative Furnace in the Forging Shop (Der Regenerativofen als Schmiedofen). Ernst H. Steck. Describes the furnace and discusses its applicability to this class of work. Ills. 2700 w. Zeitschr d Ver Deutscher Ing—July 3, 1909. No. 7468 D.

See also Castings, and Forging Hammers, under MACHINE WORKS AND FOUNDRIES; and Fuel Oil, under STEAM ENGINEERING.

Galvanizing.

Modern Methods of Galvanizing. Illustrates and describes the electrolytic and sherardizing processes. 1000 w. Ir & Coal Trds Rev—Oct. 30, 1908. No. 203 A.

Gear Cutting.

An English Universal Gear Cutting Machine. Joseph Horner. Illustrated description of a 54-in. machine that cuts spurs and spirals with a hob or circular cutter and worm wheels with a taper hob or fly cutter. 2500 w. Am Mach—Vol. 31. No. 47. No. 361.

The Cutting of Elliptic Gears. Warren E. Thompson. Describes the process. Ills. 900 w. Am Mach—Vol. 32. No. 4. No. 2140.

A Hobbing Cutter for Finishing Wheels. P. A. Thompson. Illustrates and describes a special finishing hob. 1200 w. Am Mach—Vol. 32. No. 4. No. 2136.

Recent Developments in Gear-Cutting Machinery. Ralph E. Flanders. Illustrates and describes new machines. 2500 w. Mach, N Y—Feb., 1909. No. 2242 C.

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Gear Cutting

Cutting Helical Gears on the Brown and Sharpe Automatic Screw Machine. Illustrated detailed description. 2000 w. Mach, N Y—April, 1909. No. 3649 C.

The Making of Gear Shaper Cutters. Considers the generation of curved surfaces as applied to the making of the formed cutters for the Fellows gear shaper. Ills. 2500 w. Am Mach—Vol. 32. No. 15. No. 3939.

Machine Cut Helical Gears. Describes gear wheels which can be cut up to a diameter of 20 ft. and 3 ft. breadth. Ills. 900 w. Ir & Coal Trds Rev.—May 28, 1909. No. 5411 A.

See also Gears and Hobs, under MACHINE ELEMENTS AND DESIGN.

Grinding.

Grinding Threading Chasers for Brass Work. Ethan Viell. An illustrated article describing methods. 1500 w. Mach, N Y—Nov., 1908. No. 36 C.

Grinder Kinks. Paul W. Abbott. Illustrates and describes a number of tools and fixtures for use on grinding machines. 1500 w. Mach, N Y—Dec., 1908. No. 763 C.

The Manufacture of Steel-Balls for Tumbling Purposes. Illustrates and describes machines and methods of grinding large steel balls. 1200 w. Brass Wld—March, 1909. No. 3442.

Grinding Machines.

The New Bath Grinders. Illustrated detailed description of the new universal grinder known as No. 2½. 2500 w. Ir Age—Jan. 28, 1909. No. 2120.

A New Grinder for Rapid Internal Work. Illustrated detailed description of the Bath double-head internal grinder and its operation. 2000 w. Am Mach—Vol. 32. No. 9. No. 2934.

The Bath Duplex Internal Grinding Machine. Illustrated detailed description of the latest machine for this work. 2500 w. Ir Age—Sept. 30, 1909. No. 8198.

German Designs of Internal Grinding Machines. Oskar Kylin. Illustrates and describes grinding machines for special purposes. 1000 w. Mach, N Y—Jan., 1909. No. 1554 C.

Automatic Machine for Rectifying and Grinding Hobs for Cutting Gear Wheels. Illustrates and describes the invention of Marcel Lejeune. 500 w. Prac Engr—Dec. 25, 1908. No. 1513 A.

The Brown & Sharpe No. 12 Plain Grinder. Illustrated description of a new size having a number of improvements. 1200 w. Ir Age—May 27, 1909. No. 5009.

MACHINE WORKS AND FOUNDRIES

Lacquering

Notes on the Design of a Grinding Machine. Diagrams and details of the work are given. 2000 w. Am Mach—Vol. 32. No. 35. No. 7524.

See also Lathes, under MACHINE WORKS AND FOUNDRIES.

Grinding Wheels.

The Making of Modern Grinding Wheels. Gives an illustrated outline of the process by which carborundum is made, and its manufacture into grinding wheels. 2000 w. Am Mach—Vol. 32. No. 13. No. 3651.

Gun Making.

Making Big Guns at Bethlehem Steel Co. E. F. Lake. Illustrates and describes interesting features of work on guns for the U. S. Government. 1500 w. Am Mach—Vol. 32. No. 14. No. 3831.

Hydraulic Machines.

See Riveting Machines, under HYDRAULIC MACHINERY.

Hydraulic Tools.

Watson-Stillman Hydraulic Shears. Illustrated description of a new beam shear and a coping machine. 1200 w. Ir Age—Aug. 19, 1909. No. 7132.

Inoxidation Processes.

Inoxidation Processes for Protection of Iron and Steel. Alfred Sang. Brief reviews of the various processes. 2500 w. Elec-Chem & Met Ind—Aug., 1909. No. 6826 C.

Jigs.

Some Interesting Types of Drill Jigs. Illustrates and describes handy devices. 1500 w. Am Mach—Vol. 32. No. 27. No. 6212.

Standard Designs of Jigs and Fixtures for the Manufacture of Small Interchangeable Parts. Frank P. Crosby. Illustrations with concise descriptions of essential points. 1500 w. Mach, N Y—July, 1909. No. 6666 C.

Jig for Drilling Grate Arms. C. E. Lester. Brief illustrated description. 400 w. Boiler Maker—Aug., 1909. No. 6929.

Hints to Jig Designers. A. Whitehead. Remarks on general principles. 1200 w. Mech Wld—July 16, 1909. Serial, 1st part. No. 6666 A.

Lacquering.

The Process of Lacquering Brass Bedsteads. Describes a method recently patented by William W. Vincent, by which the tubing is heated by electricity. 1400 w. Brass Wld—March, 1909. No. 3446.

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Lathes

MACHINE WORKS AND FOUNDRIES

Machine Tools

Lathes.

A New Automatic Multiple Spindle Lathe. Illustrates and describes the features of interest. 1500 w. *Ir Trd Rev*—Dec. 3, 1908. No. 792.

A Heavy 36-In. American Lathe. Illustrated description of a large lathe built at Cincinnati. 1600 w. *Ir Age*—Dec. 24, 1908. No. 1250.

A Lathe Converted Into a Cylinder Grinder. M. E. Dawson. Line drawings and description. 800 w. *Am Mach*—Vol. 32. No. 3. No. 1866.

The Whitcomb-Blaisdell Cushion Clutch Geared Head Lathe. Illustrated description of a new single pulley drive all-g geared friction head engine lathe designed for a wide range of usefulness. 1800 w. *Ir Age*—Dec. 31, 1908. No. 1396.

Large Work on Cleveland Automatics. Illustrates samples of work and tools used, describing methods. 1200 w. *Am Mach*—Vol. 32. No. 11. No. 3221.

Circular Dividing Attachment for the Bench Lathe. Walter Gribben. Illustrated description. 2500 w. *Am Mach*—Vol. 32. No. 19. No. 4634.

An Unusual Turret Lathe Equipment. C. L. Goodrich. Illustrates and describes the methods and special tools used for machining joints, valves, valve-seats and connections. 1200 w. *Am Mach*—Vol. 32. No. 23, No. 5264.

Truing a Bench Lathe Bed. Walter Gribben. Illustrated description of the work. 1000 w. *Mach, N Y*—July, 1909. No. 6067 C.

Sellers Car-Wheel Lathe. Illustrated description of the machine and its operation. 1500 w. *Mach, N Y*—July, 1909. No. 6072 C.

Sellers 42-In. Car-Wheel Lathe. Illustrated detailed description. 2500 w. *R R Age Gaz*—July 23, 1909. No. 6633.

The Lodge & Shipley Marvel Lathe. Illustrated detailed description of an improved design primarily for the rapid production of duplicate parts. 2500 w. *Ir Age*—July 29, 1909. No. 6756.

Improvements in Multiple Spindle Lathes and Like Machines. Illustrates and describes an invention patented by George Mellis for intermittently rotating the turret head, for stopping its rotation and locking it in various positions. 1500 w. *Prac Engr*—Nov 13, 1908. No. 428 A.

Multiple Turning and Grinding Shafting Lathe. Illustrated description. 800 w. *Engng*—Dec. 25, 1908. No. 1539 A.

Lathe Chuck and Chuck-Operating Mechanism. Illustrates and describes a mechanism especially applicable to lathes used in finishing small articles, 1200 w. *Mech Engr*—Jan. 1, 1910. No. 1511 A.

Lathe for Turning Large Turbine Rotors. Illustrated description of a large lathe for the Fairfield Shipbuilding & Engineering Co. 600 w. *Engng*—March 19, 1909. No. 3622 A.

Precision Lathe for the Finishing of Steam Turbine Rotors (Präzisions-Drehbank zur Fertigbearbeitung von Dampfturbinen-Laufwalzen). Illustrated description with detailed plates of a lathe built for the Vulkan works, Stettin, by Wagner & Co. 500 w. *Schiffbau*—Nov. 25, 1908. No. 1165 D.

A Large Turbine Lathe. Illustrations and brief description of a large turbine lathe built at Leeds, for marine engine works at Genoa. 500 w. *Engr, Lond*—Sept. 3, 1909. No. 7759 A.

Large Turbine Rotor Lathe. Illustrated description of a lathe capable of swinging rotors with their blades up to 17 ft. diameter, and which will admit work up to 55 ft. in length. 600 w. *Engr, Lond*—May 14, 1909. No. 4969 A.

Capstan Lathe. Illustrated description of a new type built in England. 500 w. *Engng*—Oct. 8, 1909. No. 8892 A.

30-In. Crank-Axle Lathe. Illustrated description of a motor-driven lathe, designed for work on locomotive crank-axes. 500 w. *Engng*—March 12, 1909. No. 3420 A.

Wheel and Tyre Lathes. Illustrated description of the latest design of Messrs. G. & A. Harvey, Ltd., of this tool for turning the wheels of locomotives, boring tyres, or turning bosses. 400 w. *Engng*—Oct. 15, 1909. No. 8931 A.

Special French Lathes for Bar Work. Joseph G. Horner. Illustrated detailed description of one of these lathes and its operation. 1200 w. *Am Mach*—Vol. 32. No. 17. No. 4354.

Machine Tools.

Elements of Machine Manufacture. Fred J. Miller. Lecture at Columbia Univ., N. Y. Discusses the design, construction, strength, cost, etc., of machine tools. Diagrams. 5000 w. *Mach, N Y*—April, 1909. No. 3647 C.

The Factors Influencing the Efficiency of Metal-Working Machine Tools. M. H. Landis. Brief consideration of the many factors affecting the efficiency. 1000 w. *Sib Jour of Engng*—March, 1909. No. 4053 C.

MECHANICAL ENGINEERING

Machine Tools

MACHINE WORKS AND FOUNDRIES

Milling Cutters

Some Thoughts on Machine Tool Design. Forrest C. Cardullo. Considers speed and feed changes, vibration, bearings, and related subjects. 5000 w. Mach, N Y—July, 1909. No. 6065 C.

Chapters in the Early History of Machine Tools. Joseph Horner. The present article outlines the history of the lathe. Ills. 3000 w. Mach, N Y—Sept., 1909. Serial. 1st part. No. 7497 C.

An Early Chapter in Machine Tool Design. Gives tracings made by James Nasmyth & Co., and Joseph Whitworth & Co., in the years 1856 & 1857, with descriptions. 1000 w. Am Mach—Vol. 32, No. 41. No. 8799.

Boulton and the Soho Works. Illustrated descriptions of old tools for boring, lathes, hammers, Murdoch's gas plant, planing machine, etc. 1000 w. Engr, Lond—Sept. 10, 1909. No. 7867 A.

The Modern Machine Tool. Editorial review of the remarkable advance made in this field. 2500 w. R R Age Gaz—Sept. 3, 1909. No. 7583.

Highly Developed Special Machine Tools. Illustrates and describes tools used at the plant of the Hersey Mfg. Co. 2500 w. Am Mach—Vol. 31. No. 49. No. 769.

Marine Turbine Blading and Shipyard Tools. Illustrates and describes special machines used at the Fore River Shipbuilding Co. and the new form of blading for Curtis marine turbines. 3000 w. Am Mach—Vol. 32. No. 10. No. 3081.

Special Tools for Machining Cylinders. Claude Aiken. Illustrates and describes different styles of machines, in which as many as five separate operations may be in progress at one time. 1000 w. Am Mach—Vol. 32. No. 24. No. 5570.

Special Machines for Making Comptometers. Illustrates and describes force and punch presses, spring making machine, lathe gage, riveting hammer, etc. 1500 w. Am Mach—Vol. 32. No. 37. No. 7770.

Portable Tools Electrically Driven. S. R. Stone. Illustrates and describes shapers, planers, drill presses, special combination and ball socket boring machines as portable tools used in Cincinnati shops of the Allis-Chalmers Co. 3000 w. Am Mach—Vol. 32. No. 42. No. 8806.

Horizontal Boring, Drilling, Tapping, Studding, and Milling Machine. Illustrated detailed description of a machine built for an engineering firm in Glasgow. 1200 w. Engr, Lond—Aug. 13, 1909. No. 7332 A.

The Ernst Schiess Works, Düsseldorf. Illustrates and describes some products of these machine-tool works. 1200 w. Engng—Aug. 6, 1909. Serial, 1st part. No. 7105 A.

Messrs. Drummond Brothers' Machine-Tools at Olympia. Illustrated description, especially of the radial foot-drill built by this firm. 2500 w. Engng—Nov. 20, 1908. No. 738 A.

Some French Machine-Tools at the Franco-British Exhibition. Describes interesting examples of French practice. Ills. 1500 w. Engng—Oct. 30, 1908. Serial. 1st part. No. 190 A.

Six Alsatian Machine Tools of Recent Design. Illustrated descriptions of motor-driven machines exhibited at Nancy, France. 2000 w. Am Mach—Vol. 32. No. 39. No. 8201.

Modern Swedish Machine Tools. Oskar Kylin. Illustrates and describes representative types. 1500 w. Mach, N Y—March, 1909. No. 2913 C.

See also Bearings, Clutches, and Shop Practice, under MACHINE ELEMENTS AND DESIGN; and Shops, under RAILWAY ENGINEERING, MOTIVE POWER AND EQUIPMENT.

Magnetic Separators.

Magnetic Separators for Various Uses. S. R. Stone. Illustrates and describes methods of separating iron products from sand, clay, coke, coal, scrap, junk, etc., and the saving effected. 2500 w. Am Mach—Vol. 32. No. 17. No. 4352.

Milling.

Setting-Angles for Milling Angular Cutters and Taper Reamers. W. A. Knight. Diagrams and directions for calculations, with tables, and examples. 4000 w. Mach, N Y—Nov., 1908. No. 33 C.

Milling Fixtures Used in a Russian Shop. J. W. Carrel. Illustrated description of devices and methods used in the manufacture of cigarette machines. 300 w. Am Mach—Vol. 32. No. 1. No. 1622.

Milling Cutters.

The Development of a High Speed Milling Cutter, with Inserted Blades for High Powered Milling Machines. Wilfred Lewis and William H. Taylor. Describes the cutter, discussing points considered in its construction, reporting tests. Ills. 2200 w. Jour Am Soc of Mech Engrs—Mid-Nov., 1908. No. 656 F.

Development of the High Speed Milling Cutter, with Inserted Blades, for High Powered Milling Machines. Wilfred Lewis

MECHANICAL ENGINEERING

Milling Cutters

MACHINE WORKS AND FOUNDRIES

Molding

and William H. Taylor's paper is discussed. 4000 w. Jour Am Soc of Mech Engrs—March, 1909. No. 3464 F.

A New High Speed Milling Cutter. William H. Taylor. Illustrates and describes the development of an inserted blade cutter giving remarkable results. 3500 w. Am Mach—Vol. 32. No. 1. Serial, 1st part. No. 1619.

Clearance of Milling Cutters. Harry A. S. Howarth. Shows graphically the factors that determine the clearance which should be ground. 3000 w. Mach, N Y—March, 1909. No. 2910 C.

The Design of Milling Cutters. C. J. Morrison. Outlines practice said to produce efficient cutters at low cost. Ills. 1500 w. Am Engr & R R Jour—April, 1909. No. 3799 C.

Tools for Milling Turbine Buckets. William E. Snow. Illustrates and describes the rotary milling attachment, special cutters, and a cutter-driving device. 1000 w. Am Mach—Vol. 32. No. 14. No. 3835.

Milling Machines.

Accurate Index Wheels and Milling Operations. Illustrated description of special machines for milling channels in type setter cylinders. 1500 w. Am Mach—Vol. 31. No. 45. No. 122.

Efficiency Tests of Milling Machines and Milling Cutters. A. L. De Leeuw. Deals with the efficiency problem only, showing results obtained rather than the means by which they were obtained. Ills. 6000 w. Jour Am Soc of Mech Engrs—Nov., 1908. No. 641 F.

Efficiency Tests of Milling Machines and Milling Cutters. Discussion of A. L. DeLeeuw's paper. 4500 w. Jour Am Soc of Mech Engrs—March, 1909. No. 3465 F.

Vertical Milling Machine. Illustrated description of a new pattern brought out by Messrs. Albert Herbert, Ltd. 800 w. Engrg—Dec. 11, 1908. No. 1215 A.

Milling Machine Tests. P. V. Vernon. Illustrates and describes tests carried out in the workshop of Alfred Hubert, Limited, with a view to collecting data as to the capacity and efficiency. 2000 w. Engr, Lond—March 19, 1909. No. 3623 A.

A High-Speed Vertical Milling Machine. Illustrated detailed description of a machine built in Birmingham, Eng. 1000 w. Engr, Lond—Sept. 17, 1909. No. 8135 A.

See also same title, under MACHINE ELEMENTS AND DESIGN.

Molding.

The Use of Strickles and Sweeps. James F. Buchanan. A summary of the advantages of these tools in the making of molds and cores. Ills. 2500 w. Foundry—Dec., 1908. No. 757.

Making Molds for Casting Turbine Wheels. Illustrated description of a method invented by Levi J. Wing. 600 w. Brass Wld—March, 1909. No. 3445.

Molding Locomotive Cylinders. Paul R. Ramp. Prize paper. Discusses every phase of foundry practice relating to their production. Ills. 2500 w. Foundry—March, 1909. No. 2945.

Plaster of Paris Molds and the Method of Casting Metals in Them. An illustrated article discussing materials and methods, especially the methods used by the Gorham Mfg. Co. 5000 w. Brass Wld—April, 1909. No. 4108.

Making Mold Joints and Partings. James F. Buchanan. Suggestions for molders. Ills. 2000 w. Foundry—April, 1909. No. 3735.

Hinged Match Plate for Stone Work. Illustrated description of a new process for molding stone plates which permits of returning the pattern to the mold. 2500 w. Foundry. April, 1909. No. 3731.

Propeller Molding. Useful hints, with illustrations. 1700 w. Sci Am Sup—April 10, 1909. No. 3842.

A New Propeller Molding Method. J. F. Buchanan. An economical improved method of making propeller wheels is illustrated and described. 1000 w. Foundry—Oct., 1909. No. 8296.

Castings for Printing Presses. Illustrates and describes methods of molding large gray iron cylinders. 2500 w. Foundry—April, 1909. No. 3734.

The Use of Artificial Graphite in Making Permanent Molds. Illustrates and describes method of making the molds, and castings produced. 1500 w. Brass Wld—May, 1909. No. 4747.

The Permanent Mold and Its Effect on Cast Iron. E. A. Custer. Read before the Am. Soc. for Test. Mat. Gives results of investigations. Ills. 2500 w. Ir Trd Rev—July 15, 1909. No. 6366.

Permanent Molds for Iron Castings. Edgar A. Custer. An illustrated summary of results of recent practice. 5500 w. Ir Age—May 20, 1909. No. 4767.

Molding Eighty-Ton Engine Frames. Illustrates and describes an example of pit molding. 1200 w. Foundry—May, 1909. No. 4500.

Molding

MACHINE WORKS AND FOUNDRIES

Molding Sand

Making a Large Combination Mold. Jabez Nall. Illustrates and describes an example of core molding combined with green sand and skin dried work. 2500 w. Foundry—May, 1909. No. 4498.

Molding a Cast Steel Bolster. H. J. McCaslin. Explains the problems involved and the method of solving them. Ills. 2800 w. Foundry—July, 1909. No. 6123.

Large Flywheels Floor-Molded. Presents the advantages of this practice as compared with pit molding. Ills. 1200 w. Foundry—Aug., 1909. No. 6813.

Three Methods of Molding Pump Plungers. J. Temple McCartney. A brief résumé of the methods employed at the Drifton shops of the Lehigh Valley Coal Co. Ills. 1200 w. Foundry—Aug., 1909. No. 6816.

Molding Large Gray Iron Castings. Illustrates and describes the method of molding and casting 115-ton engine frames, and the problem of handling these large sections. 1800 w. Foundry—Oct., 1909. No. 8292.

Molding and Casting (Formen und Giessen). Theodore Löhe. A discussion of practical points. Ills. Serial, 1st part. 1500 w. Giesserei-Zeit—May 1, 1909. No. 5763 D.

See also Castings, Cores, Foundry Materials, and Foundry Appliances, under MACHINE WORKS AND FOUNDRIES.

Molding Machines.

Machine Molding for Large Castings. C. S. Bonsall. Read before the Nat. Found. Assn. Illustrated account of experience of an engine works. 2000 w. Ir Age—Nov. 26, 1908. No. 496.

Molding Machines for Large Work. An illustrated description of practice at a plant where molds weighing 10000 pounds and over are rammed on jarring machines. 1000 w. Foundry—Feb., 1909. No. 2248.

Machine Molding vs. Hand Molding. George Muntz. A discussion of molding machines, the principles that should be observed, etc. 2500 w. Am Found Assn—May 18, 1909. No. 5118 N.

Jarring and Hinged Molding Machine. Illustrated description of a large machine for molding car wheel centers. 1500 w. Foundry—March, 1909. No. 2948.

Molding Machine-Made Plowpoints. Illustrates and describes methods of mounting the patterns on a molding machine. 2000 w. Foundry—March, 1909. No. 2947.

A Difficult Molding Machine Job. Illustrates and describes the making of an

automobile crank case mold. 1200 w. Foundry—Nov., 1908. No. 50.

A New Rock-Over Molding Machine. Illustrated description of a machine for molding stove plates. 1500 w. Foundry—Jan., 1909. No. 1616.

Wilkinson's Pattern-Plate Moulding Machine. Illustrated description of an appliance for moulding plate patterns. 500 w. Engng—Dec. 25, 1908. No. 1538 A.

The Mumford High-Trunnion Squeezer Molding-Machine. Illustrations, with brief description. 800 w. Engng—July 23, 1909. No. 6849 A.

Recent Hydraulically Operated Molding Machines (Neuere Formmaschinen mit Druckwasserbetrieb). A. Lohse. Illustrates and describes a large number of machines for a variety of work. Serial. 1st part. 3000 w. Zeitschr d Ver Deutscher Ing—Aug. 21, 1909. No. 8154 D.

Recent Molding Machines (Neuere Formmaschinen). F. Hermann. Describes a number of machines for various purposes. Ills. Serial. 2 parts. 3000 w. Giesserei-Zeit—Aug. 1 and 15, 1909. No. 7958, each D.

See also Foundry Practice, and Patterns, under MACHINE WORKS AND FOUNDRIES.

Molding Sand.

Automatic Sand-Preparing Apparatus. Illustrated description of an apparatus for the automatic preparation of molding sand. 1000 w. Engng—April 2, 1909. No. 3908 A.

The Drying of Molding Sand (Ueber das Trocknen des Formsandes). E. Lambert. Illustrates and describes various drying devices. 1800 w. Stahl u Eisen—Feb. 17, 1909. No. 3362 D.

A New Plant for the Preparation and Cleaning of Molding Sand (Eine neue Sandaufbereitung). C. Henning. Describes an elaborate installation in the Strebelwerk foundry, Mannheim. Ills. 4200 w. Stahl u Eisen—June 2, 1909. No. 6560 D.

Modern Machinery and Methods for the Preparation of Molding Sand (Neuzeitliche Formsandaufbereitung und ihre Maschinen). R. Lüssenhop and Mögling. Describes particularly automatic machinery. Ills. 4400 w. Zeitschr d Ver Deutscher Ing—July 31, 1909. No. 7480 D.

Molding Sand and Its Automatic Preparation (Formsand und automatische Sandaufbereitungen). Describes modern apparatus and plants. Ills. 3200 w. Giesserei-Zeit—Sept. 1, 1909. No. 8657 D.

MECHANICAL ENGINEERING

Oil Removal

MACHINE WORKS AND FOUNDRIES

Planers

Oil Removal.

Removing Oil from Machined Pieces. Fordyce W. Brown. Illustrated description of apparatus for removing oil from small screws, studs, etc., used in the manufacture of watches. 1400 w. *Ir Age*—Sept. 23, 1909. No. 8001.

Pattern Making.

The Patternmaker and the Foundry. Remarks on the need of patternmakers having a knowledge of foundry and shop methods, describing different methods of molding a ring separator. Ills. 2000 w. *Am Mach*—Vol. 32. No. 12. No. 3489.

Pipe Patterns for Single Castings. W. Peters. Suggestions for pipe-pattern work, with illustrations. 1200 w. *Am Mach*—Vol. 32. No. 35. No. 7523.

Pattern Making for Steel Foundries (Die Schablonenformerei in Stahlformgiessereien). Leonard Treuheit. Discusses its importance and gives examples of difficult work. Ills. Serial, 1st part. 1700 w. *Stahl u Eisen*—June 2, 1909. No. 6562 D.

Pattern Materials.

See Purchasing, under INDUSTRIAL ECONOMY.

Pattern Plates.

Reversible Pattern Plate Process. George Muntz. Illustrates and describes a new and simple method of producing these plates for foundry use. 1800 w. *Foundry*—April, 1909. No. 3733.

Patterns.

Rapping Plates—A Discussion of the Proper Use and Abuse of Patterns. C. Neill. Ills. 2200 w. *Foundry*. Nov., 1908. No. 52.

The Use of an Adjustable Pattern. H. J. McCaslin. Describes the construction of a pattern for molding a cast-steel traveling crane and carriage of comparatively thin section. Ills. 2000 w. *Foundry*—Jan. 1909. No. 1612.

Composition and Metal Match Plates. Illustrates and describes methods of making these permanent pattern plates. 4000 w. *Foundry*—Jan., 1909. No. 1614.

A Forging Machine Frame Pattern. Jabez Nall. Illustrated description of how it was made to effect the greatest economies in the foundry. 2500 w. *Foundry*—Oct., 1909. No. 8295.

Patterns for Molding Machines. S. Jones Parsons. Gives examples of work that can be done on a plain molding machine. Ills. 600 w. *Mech Wld*—May 7, 1909. Serial, 1st part. No. 4662 A.

Pattern Shops.

Distribution of Pattern Shop Work. Oscar E. Perrigo. Discusses the routine of this department with a modern system. 4500 w. *Foundry*—Feb., 1909. No. 2250.

The Modern Pattern Shop Layout. A. N. Spencer. Detailed discussion of the equipment and arrangement. 3500 w. *Foundry*—May, 1909. No. 4497.

Pipe Drawing.

Making Shelby Seamless Steel Tubes. R. S. Bayard. Illustrated description of method of transforming a solid steel billet into a seamless tube. 6000 w. *Am Mach*—Vol. 32. No. 40. No. 8386.

Pipe Making.

The History of Seamless Tubes (Zur Geschichte der nahtlosen Rohren). M. Müller. A review of past and present methods of production. Ills. 3000 w. *Stahl u Eisen*—Dec. 16, 1908. No. 1943 D.

Plant Used in the Manufacture of Tubes. W. H. A. Robertson. Read before the Inst. of Metals. Describes the more important processes and the machines used. 4500 w. *Mech Engr*—July 2, 1909. No. 6298 A.

Pipe Threading.

Modern Machines for Pipe Threading. J. F. Springer. Illustrates and describes examples of modern pipe-threading machines. 4500 w. *Power*—Aug. 17, 1909. No. 7112.

Modern Machines for Pipe Threading. J. F. Springer. Illustrates and describes large pipe threading machines, and some examples of hand threading. 3500 w. *Power*—Sept. 7, 1909. No. 7599.

Pipe Tools.

A Group of Useful Pipe-Working Tools. Philip Bellows. Illustrated description of appliances for laying out, heating, bending, testing and inspecting pipe-fittings. 1500 w. *Am Mach*—Vol. 31. No. 51. No. 1070.

Planer Drive.

Details of the Mitchell Planer Drive. Illustrated description, explaining the principles. 1800 w. *Am Mach*—Vol. 32. No. 2. No. 1752.

Planers.

Vertical and Horizontal Planers. W. T. Sears. Illustrates and describes examples of these tools and their applications. 1200 w. *Am Mach*—Vol. 31. No. 53. No. 1400.

A New 240 x 42 Inch Spur Gear Planer. Illustrated description of a direct driven,

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Planing Machines

simple and effective design. 1200 w. Am Mach—Vol. 32. No. 4. No. 2135.

The Powell High Speed Accelerating Cut Planer. Illustrated description of a new type equipped with a mechanism for accelerating the speed. 1500 w. Ir Age—June 17, 1909. No. 5564.

Planing Machines.

A Propeller Planing Machine. Description of a recent design. Ills. 1000 w. Am Mach—Vol. 32. No. 11. No. 3220.

Pneumatic Tools.

Care of Pneumatic Carving Tools. W. H. Van Sickle. Directions for Keeping them in proper condition. 1000 w. Compressed Air—June, 1909. No. 5608.

The Operation of Pneumatic Tools (Etude sur le Régime de Fonctionnement d'une Installation d'Outillage actionné par l'Air comprimé). A. van Aerde. A mathematical and graphical consideration of air consumption and the time of doing specified work under stated conditions of pressure. Ills. 3000 w. All Indus—June, 1909. No. 7225 D.

See Forging Hammers, and Rivetting Machines, under MACHINE WORKS AND FOUNDRIES.

Polishing.

Finishing Metals by Polishing. Bradford H. Divine. Discusses the considerations governing the art of polishing. 5000 w. Ir Trd Rev—Jan. 28, 1909. Serial, 1st part. No. 2132.

Presses.

The Operation of Friction Presses (Der Arbeitsgang von Friktionspressen). Oskar Kron. Describes the construction and operation of various types. Ills. Serial, 1st part. 2800 w. Zeitschr f Werkzeug—April 5, 1909. No. 5059 D.

See also same title, under MACHINE ELEMENTS AND DESIGN.

Press Tools.

Press Tools Used in Clock Manufacture. Charles Doescher. Drawings and descriptions of sub press and other punches and dies. 3000 w. Am Mach—Vol. 32. No. 5. No. 2255.

Sectional Blanking and Shaving Dies. Describes and illustrates press tools of unusual construction. 2000 w. Am Mach—Vol. 32. No. 8. No. 2773.

Cutting and Piercing Punch and Die. Henry Percival. Drawings and description of a punch and die for cutting and piercing mild steel blanks. 1500 w. Am Mach—Vol. 32. No. 20. No. 4773.

MACHINE WORKS AND FOUNDRIES

Safety Devices

Sectional Die for the Subpress. A. M. Cahill. Illustrated description. 1200 w. Am Mach—Vol. 32. No. 35. No. 7522.

Simple and Automatic Stop-Pins for Press Work. H. A. S. Howarth. Illustrates and describes types, noting their uses, and their merits and faults. 2000 w. Mach, N Y—Sept., 1909. No. 7505 C.

Press Tools. W. E. Etheridge. Description of tools used for dynamo and switch gear manufacture. A paper read before Siemens Stafford Engineering Society. Ills. 2700 w. Mech Wld—May 28, 1909. No. 5442 A.

Punching.

Some Punching Tests (A propos de quelques Essais de Poinçonnage). Pierre Breuil. Gives results of a series of punching tests on thin sheets of various metals, with discussion. Ills. 4500 w. Rev de Mécan—Feb., 1909. No. 3321 E + F.

See also Steel, under MATERIALS OF CONSTRUCTION.

Punching Machines.

Punching Machines (Ueber Durchstossmaschinen). E. Kühne. Discusses their design, operation, etc. Ills. 2700 w. Zeitschr f Werkzeug—Oct. 5, 1908. No. 569 D.

Rivetting.

See Drilling, under MACHINE WORKS AND FOUNDRIES.

Rivetting Machines.

Pneumatic Jam Riveters. W. T. Sears. Illustrates and describes forms of modified toggles, and calls attention to points regarding riveting by air. 2000 w. Am Mach—Vol. 32. No. 36. No. 7699.

Portable Electro-Hydraulic Riveting Machine (Transportable elektro-hydraulische Nietmaschine). H. Spellmann. Illustrated description of a new electro-hydraulic riveter built by the Maschinenfabrik Oerlikon. 1600 w. Schiffbau—Nov. 25, 1908. No. 1166 D.

New Piat Electro-Hydraulic Riveters (Nouvelles Riveuses électro-hydrauliques Système Piat). Illustrated detailed description. 4000 w. Génie Civil—Jan. 30, 1909. No. 2645 D.

Rope Making.

The Machines That Make Cordage. Illustrates and describes some mechanical combers and "twisters" now replacing old methods of rope making. 3500 w. Am Mach—Vol. 32. No. 35. No. 7521.

Safety Devices.

See same title, under MISCELLANY.

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Safety Valves

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Safety Valves.

Safety Valve Discussion. Continued from the February meeting. 6000 w. Jour Am Soc of Mech Engrs—June, 1909. No. 5847 F.

Sand Blast.

The Sand Blast in the Foundry. James M. Betton. The first of the series of articles on the use of the sand blast for cleaning castings. 2500 w. Foundry—Nov., 1908. Serial. 1st part. No. 53.

The Sand Blast in Foundry Cleaning (Das Sandstrahlgebläse in der Gussputzerei). W. Caspari. Describes various systems, the uses of the sand blast, and apparatus for a variety of purposes. Ills. Serial, 1st part. 2800 w. Stahl u Eisen—March 17, 1909. No. 4251 D.

Saw Making.

Making Saws. Ethan Viall. Illustrated description of methods used in making the Atkins saws. 1800 w. Mech, N Y—March, 1909. No. 2911 C.

Saws.

What Can Be Done with a Cold Saw. Roger Atkinson. Describes types and the methods of using them. Ills. 1500 w. Ry & Loc Engng—March, 1909. No. 2939 C.

The Hot-Saw as a Cutoff Machine. H. Terhune. Illustrates and describes this machine and some of its work. 1000 w. Am Mach—Vol. 32. No. 23. No. 5352.

The Management of Band Saws (Ueber die Behandlung von Blockbandsägen). David Dominicus. A discussion of their operation and care. Ills. Serial, 1st part. 2700 w. Zeitschr f Werkzeug—June 25, 1909. No. 6592 D.

Scraping.

Labor-Saving Devices for Scraping Operations. Alfred Spangenberg. Illustrates and describes a number of devices for pulling, holding, etc. 2000 w. Mach, N Y—April, 1909. No. 3644 C.

Shapers.

Comparative Tests of Two Shapers. Henry P. Noble. Tests to determine the relative wear, accuracy of work, deflection, and power consumed. Ills. 2000 w. Am Mach—Vol. 32. No. 18. No. 4517.

Shears.

See Electric Driving, under POWER AND TRANSMISSION.

Sheet Metal Work.

Punch and Die for Corrugating Thin Copper Sheets. A. L. Monrad. Illustrated description of punch and die designed

for forming copper corrugations from copper sheets. 2000 w. Mach, N Y—April, 1909. No. 3645 C.

Shop Accidents.

An Analysis of 5500 Machine-Shop Accidents. L. P. Alford. An analysis based on shop-hospital records, showing that most accidents were due to the natural hazards of the occupation. 4000 w. Am Mach—Vol. 32. No. 6. No. 2457.

Shop Appliances.

Details of Manufacturing Equipment. Foundry, machine shop, testing, storage and general details are described and illustrated. 2500 w. Am Mach—Vol. 31. No. 51. No. 1072.

Forming Dies for Railroad Forge Shops. G. M. Steward. Illustrates and describes some of these devices. 600 w. Am Mach—Vol. 32. No. 1. No. 1623.

Fixtures Used in Machining Miller Parts. A. J. Baker. Describes tools which handle two parts cast in one piece and cut apart afterwards. Ills. 1500 w. Am Mach—Vol. 32. No. 8. No. 2774.

Application of Lifting Devices to Assembling Work. Alfred Spangenberg. Illustrates and describes simple devices for handling work. 1300 w. Mach, N Y—Feb., 1909. No. 2246 C.

Accurate Textile Machinery Making. Illustrates and describes devices used in making the Mayo knitting-machines, outlining the method of manufacture. 1600 w. Am Mach—Vol. 32. No. 12. No. 3486.

Universal Radial Drill Equipped for Jig Work. A. J. Baker. Description of attachments and their use. 900 w. Am Mach—Vol. 32. No. 12. No. 3487.

Flanging, Punching and Welding. Claude Aiken. Illustrates and describes shop equipment and methods. 2000 w. Am Mach—Vol. 32. No. 11. No. 3218.

Tools for the Workshop. I. G. Bayley. The present number describes a carpenter's clamp, and a steam box. Ills. 700 w. Sci Am—April 24, 1909. Serial, 1st part. No. 4112.

Some Interesting Shop Tools and Methods. Describes interesting applications of concrete, tools and fixtures in use in Greenfield, Mass. Ills. 1600 w. Am Mach—Vol. 32. No. 14. No. 3833.

Some Test Fixtures and a Milling Attachment. Illustrates and describes tools used in finishing and testing the parts of the Burroughs adding machine. 1200 w. Am Mach—Vol. 32. No. 15. No. 3941.

Special Tools and Devices for Automobile Factories. Ethan Viall. Illustrates

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and describes devices used at the factory of the E. R. Thomas Motor Co., Buffalo, N. Y. 800 w. Mach, N Y—April, 1909. No. 3641 C.

Special Automobile Factory Tools and Devices. Ethan Viall. Illustrates tools used in a Buffalo shop. 2000 w. Mach, N Y—May, 1909. No. 4426 C.

Machines and Tools for Automobile Manufacture. C. B. Owen. States the requirements and conditions under which motor cars operate and the effect on tool design, as carried out in the factory of the Cadillac Co., Detroit, Mich. Ills. 3500 w. Mach, N Y—June, 1909. No. 5176 C.

Jigs and Tools for Machining Petrol-Engine Cylinders. T. Alex. Borthwick. Reviews some of the methods successfully adopted and the tools used. Ills. 2000 w. Mech Wld—May 28, 1909. No. 5457 A.

Knurls and Knurling Operations. Douglas T. Hamilton. An illustrated review of tools and appliances necessary for knurling, with formulae and data. 2000 w. Mach, N Y—June, 1909. Serial, 1st part. No. 5174 C.

Proper Designing of Milling and Drilling Fixtures and Jigs. R. B. Little. Gives a catechism of things to be considered before designing. 1500 w. Mach, N Y—May, 1909. No. 4427 C.

Milling, Bending and Testing Fixtures. Illustrates and describes how accurate machine parts are finished by special appliances. 2000 w. Am Mach—Vol. 32. No. 28. No. 6326.

Some Typewriter Shop Tools. J. P. Quinn. Illustrates and describes devices used in typewriter manufacture. 1500 w. Am Mach—Vol. 32. No. 34. No. 7345.

A Twenty-five Dollar Tool-Making Job. H. J. Bachmann. Gives in detail the money spent on an extensive spindle for a drill press, and the benefits derived from its use. 1200 w. Mach, N Y—Aug., 1909. No. 6811 C.

Self-Contained Backing-Off Attachment. W. J. Kaup. Illustrated description of a new design to be used for formed cutters. 700 w. Am Mach—Vol. 32. No. 36. No. 7701.

Shop Construction.

See Shop Design, under MACHINE WORKS AND FOUNDRIES.

Shop Cooling.

The Cooling of Factories by the Evaporation of water (Refrachissement des Locaux industriels par Evaporation

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d'Eau). A. Papin. Describes methods and apparatus. Ills. 5500 w. Génie Civil—May 1, 1909. No. 5737 D.

Shop Design.

Machine Grouping and Factory Layout, as Affecting Cost Data. C. H. Stilson. Discusses the influence of the location of machinery upon factory costs. Ills. 1800 w. Cassier's Mag—Jan., 1909. No. 1725 B.

The Planning and Building of Industrial Plants. Charles Day. A systematic study from preliminary service to occupancy. 4500 w. Engineering Magazine—Sept., 1909. Serial, 1st part. No. 7414 B.

The Planning and Building of Industrial Plants. Charles Day. The second article of a series, giving a study of the problems of factory construction. 6000 w. Engineering Magazine—Oct., 1909. No. 8175 B.

The Planning and Building of Industrial Plants. Charles Day. This third article of a series considers the financing and preparation of detail plans and specifications. 7000 w. Engineering Magazine—Nov., 1909. No. 8834 B.

The Design of Industrial Works. George H. Gibson and A. Home-Morton. Abstract of paper read before the Glasgow Tech. Col. Sci. Soc. The factors and requirements deserving consideration to secure a well-designed and well-equipped works, with discussion of details. 3500 w. Mech Engr—July 30, 1909. No. 6972 A.

Shop Furniture.

Metallic Shop and Store Room Furniture. Illustrated description of fireproof furniture. 1500 w. Am Mach—Vol. 31. No. 50. No. 909.

Shop Heating.

The Problem of Heating Mills. A. S. Atkinson. Suggestions for the installation of heating systems in factories. 2000 w. Dom Engng—Dec. 19, 1908. No. 1039.

The Choice of Heating Equipment for Manufacturing Plants. G. W. Stanton. Describes the various types of heating systems, explaining the conditions for which such is adapted. 3500 w. Engineering Magazine—July, 1909. No. 5974 B.

Shop Heating. F. R. Still. Discusses the field of the blower system. 2000 w. Met Work—Jan. 16, 1909. No. 1756.

Shop Heating—A Treatise Containing Many Practical Suggestions. F. R. Still. Explains how a system should be laid out and operated to assure the best results. 3500 w. Foundry—Feb., 1909. No. 2249.

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Heating Plant of the German Auer Light Company, Berlin (Die Heizungsanlage im Fabrikgebäude der deutschen Gasglühlicht - Aktiengesellschaft, Berlin). Karl Brabée. A discussion of high-pressure, live-steam heating. Ills. 6000 w. Gesundheits-Ing—April 3, 1909. No. 4884 D.

Shop Hygiene.

Dust Removal in the Grinding Trades. C. Johnston and S. R. Bennett. From 1908 report of the Chief Inspector of Factories and Workshops. Describes experiments undertaken with a view to devising means to prevent inhalation of dust. 2800 w. Mech Engr—July 9, 1909. No. 6417 A.

A Simple Method for the Detection of Gaseous Impurities in the Air of Factories (Vereinfachte Methoden zur Bestimmung der gasförmigen Verunreinigungen in der Fabrikluft). Martin Hahn. 4000 w. Gesundheits-Ing—Oct. 31, 1908. No. 589 D.

Improvements in the Hygienic Arrangement and Operation of Workshops. (Perfectionnements hygiéniques réalisés dans l'Installation et la Fonctionnement des Ateliers industriels). A review of the report of the French Minister of Industry, covering heating, ventilation, lighting, etc. 4500 w. Rev d'Econ Indus—Mar. 16, 1909. No. 4200 D.

The Separation of Dust from Air (Die Trennung von Staub und Luft in Absauganlagen). Ewald Mees. Describes various apparatus for separating dust from aid in industrial plants. Ills. 2700 w. Zeitschr d Ver Deutscher Ing—April 17, 1909. No. 5073 D.

See also Textile Mills, under MISCELLANY.

Shop Leasing.

Tenant Mills, Charles C. Klein. The first of a series of articles giving information relating to this class of manufacturing. The present article deals with their origin and some of the features of construction. 2000 w. Ind Engng—June, 1909. Serial. 1st part. No. 5698 C.

Shop Lighting.

Standards of Illumination for Manufacturing Plants. H. Thurston Owens. The qualities, advantages, and limitations of various systems are considered. Ills. 2000 w. Engineering Magazine—July, 1909. No. 5979 B.

The Principles of Shop Lighting. J. H. Stickney. Outline of Available Systems with chief characteristics of each. Ills. 3000 w. Indus Engng—Oct. 15, 1909. No. 8578 B.

Some Notes on Shop Lighting. W. S. Giele. Discusses the relative advantages of various methods. 1200 w. Wood Craft—Dec., 1908. No. 821.

Notes on Shop Lighting and the Cost of Artificial Illumination (Dispositions générales de l'Eclairage des Ateliers et Dépense de l'Eclairage artificiel). Louis Pichenot. Considers sun light and illumination by oil, electric, gas, and acetylene lamps. 3000 w. Rev d'Econ Indus—Dec. 16, 1908. No. 1900 D.

See also Incandescent Lamps, under ELECTRICAL ENGINEERING, LIGHTING.

Shop Management.

See Management, under INDUSTRIAL ECONOMY.

Shop Photography.

Industrial Photography. S. Ashton Hand. An illustrated paper dealing with apparatus, preparation, focusing, copying, enlarging, etc. 3000 w. Jour Am Soc of Mech Engrs—Nov., 1908. No. 642 F.

Shop Practice.

Ways and Means of Producing Work in the Machine Shop. W. Burns. A summary of shop conditions contributing to efficiency with suggestions for improvements. 2000 w. Engineering Magazine—Dec., 1908. No. 675 B.

Machine Shop Practice. The present number describes cylindrical grinding, illustrating machines. 2000 w. Mach, N Y—April, 1909. Serial. 1st part. No. 3650 C.

Machine-Tool Practice for Maximum Production. Charles Day. First of a series of six articles discussing the principles of machine-shop practice for maximum production. Ills. 3500 w. Engineering Magazine—July, 1909. No. 5994 B.

Machine Tool Practice for Maximum Production. Charles Day. Second article of a series, considering the design and construction of tools for specified performance. Ills. 3500 w. Engineering Magazine—Aug, 1909. No. 6747 B.

Machine Shop Practice. Discusses shrinking and forcing fits. Supplement. 1200 w. Mach, N Y—July, 1909. No. 6070 C.

Laying Out Work. Gives examples of the laying out of machine parts, with illustrations from various kinds of work. 1000 w. Mach, N Y—Aug., 1909. Serial, 1st part. No. 6810 C.

Some Points on Marking-Off. W. Burns. Suggestions in marking-off for machining. 1200 w. Mech Wld—June 4, 1909. No. 5521 A.

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The Modern Spirit in the Machine Shop (Der moderne Geist in der Maschinenfabrik). Alexander Rothert. A review of modern tendencies in production engineering. Serial, 1st part. 4000 w. Tech u Wirt—Aug., 1909. No. 8152 D.

Modern Workshop Practice. R. E. L. Maunsell. Read before the Engng. & Sci. Assn. of Ireland. Briefly discusses changes due to high-speed machine tools and use of high-speed steel. 3000 w. Mech Wld—Dec. 18, 1908. No. 1387 A.

Making Pliers of Various Kinds and Sizes. Illustrates and describes novel methods and details of a new shop at Utica, N. Y. 2200 w. Am Mach—Vol. 31. No. 48. No. 627.

Machining the Casting for a Plain Milling Machine Column. B. R. Ashe. Prize paper. Illustrated description of the work. 1500 w. Mech Wld—Oct. 30, 1908. No. 179 A.

Axle Turning—Methods and Production. A study of the conditions that tend toward large output. 3500 w. Mach, N Y—Feb., 1909. No. 2241 C.

Manufacturing Air-Cooled Cylinders. F. J. Haynes. Some of the processes are illustrated and described. 1000 w. Mach, N Y—March, 1909. No. 2914 C.

Machining the Knee of a Cutter Grinder. A. J. Baker. Illustrates and describes the operations in their order. 1200 w. Am Mach—Vol. 32. No. 10. No. 3082.

Method of Making Master Tools for Eyclet Sets. Warren E. Thompson. Illustrates and describes the special machinery. 1600 w. Mach, N Y—March, 1909. No. 2912 C.

Special Machinery Used in Making Automobiles. Thomas J. Fay. An illustrated article giving information in regard to the processes and special tools used in this work. 2500 w. Automobile—Oct. 7, 1909. No. 8418.

Machine Work in the Rambler Automobile Factory. Ethan Viall. Illustrated description of methods used. 1200 w. Am Mach—Vol. 32. No. 1. No. 1620.

Automobile Cylinder and Piston Finishing. Hugh Dolnar. Illustrates and describes methods—especially the Cartercar practice. 1200 w. Am Mach—Vol. 32. No. 26. No. 6094.

Automobile Engine Cylinder and Piston Finishing Practice. Hugh Dolnar. Illustrates and describes the practice of the Am. Simplex Motor Car Company. 1200 w. Am Mach—Vol. 32. No. 27. No. 6208.

The Design and Manufacture of a High-Grade Motor Car. Ralph E. Flinders. Illustrated detailed description of the factory, methods, and products of the Stevens-Duryea Co. 7000 w. Mach, N Y—Oct., 1909. No. 8279 C.

Automobile Factory Practice. Ethan Viall. Illustrated detailed description of methods used by the Dayton Motor Car Co. 2500 w. Mach, N Y—Oct., 1909. No. 8281 C.

Building the Franklin Automobiles. Illustrates and describes some of the tools, fixtures and methods used in building these air-cooled cars. 2500 w. Am Mach—Vol. 32. No. 41. No. 8800.

Building the Pierce Great Arrow Car. Illustrated description of methods, tools, etc., used in a plant at Buffalo, N. Y. 2500 w. Am Mach—Vol. 32. No. 15. No. 3938.

Machining Petrol Motor Cylinders. Sydney Laurence. Illustrated detailed description of tools and methods used. 1200 w. Mech Wld—April 9, 1909. Serial, 1st part. No. 3991 A.

Machining Automobile Pistons. Gives sequence of operations, reviewing the essential points. Ills. 1500 w. Prac Engr—Dec. 18, 1908. No. 1386 A.

Machining Motor Car Twin Cylinders. Considers operations to be performed in machine shop in sequence. Ills. 1200 w. Prac Engr—Feb. 26, 1909. Serial, 1st part. No. 3056 A.

Making the Colt Automatic Pistol. Illustrated description of interesting features of the Colt Armory, at Hartford, Conn., and the methods used in working the parts so as to avoid brazed or screwed joints. 2500 w. Am Mach—Vol. 32. No. 28. No. 6324.

Manufacturing the Smith Premier Typewriter. Illustrated description of factory and methods. 5500 w. Ind Engng—July 15, 1909. No. 6675 C.

The Making of Incandescent Electric Lamps. Illustrates and describes some of the automatic and semi-automatic machines employed, and the methods. 3000 w. Am Mach—Vol. 32. No. 29. No. 6611.

Electric Lamps in the Making. Frederick Blount Warren. Illustrated description of methods used in a Philadelphia plant. 1500 w. Sci Am—Aug. 7, 1909. No. 6958.

Details of Watt-Hour Meter Manufacture. Joseph B. Baker. Illustrated description of features of interest in this work. 3500 w. Elec Rev, N Y—Aug. 14, 1909. Serial, 1st part. No. 7066.

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Record Breaking Engine Building. An illustrated account of the building of a 36 x 72-inch heavy-duty Corliss engine in 30 days. 1200 w. Am Mach—Vol. 32, No. 16. No. 4103.

Machining Heavy Connecting-Rod, Bearing and Details. Describes the necessary operations and the machines advocated. Ills. 1500 w. Prac Engr—July 2, 1909. Serial, 1st part. No. 6296 A.

Machining Heavy Connecting Rods. Allan Jenkins (Prize paper.) Illustrated description of the method used. 3000 w. Mech Wld—June 11, 1909. No. 5641 A.

Operations in Building and Inspecting Lathes. Illustrates and describes the methods of the Hendey Machine Co., Torrington, Conn. 3000 w. Am Mach—Vol. 32. No. 31. No. 6895.

Making Steel Balls for Ball Bearings. Snowden B. Redfield. Illustrates and describes the methods of manufacture. 2000 w. Am Mach—Vol. 32. No. 28. No. 6328.

The Manufacture of Crank-Shafts. Illustrated detailed description of methods used by a Philadelphia manufacturer. 3500 w. Mach, N Y—July, 1909. No. 6069 C.

The Manufacture of Piston Rings. James McIntosh. Suggestions, describing methods. 1500 w. Mach, N Y—June, 1909. No. 5178 C.

Snap Piston Rings and Their Making. F. A. Halsey. Describes the making of rings to fit the cylinders when new, and gives a scale of proportions. 1500 w. Am Mach—Vol. 32. No. 22. No. 5211.

Machining Sluice Valve Body and Plug. H. Pearman. Prize paper. Illustrated directions for the work. 1200 w. Mech Wld—Oct. 15, 1909. No. 8887 A.

Machining a Cast-Iron Lathe Headstock. G. H. Gibbs. Prize paper. Illustrates and describes the different operations, giving time required for each. 2500 w. Mech Wld—Jan. 22, 1909. No. 2213 A.

Building the Rotors of High-Speed Hydraulic Turbines (Construction en Série des Roues mobiles des Turbines mixtes à grande Vitesse). Jacques Lafitte. Discusses the methods of molding and attaching the canes. Ills. 2000 w. Génie Civil—March 6, 1909. No. 4234 D.

Interesting Methods in the Thomas Shop. Illustrates and describes methods of setting and boring cylinders, fixtures for crank cases, cam shafts, Gisholt lathes and grinders, and a device for testing springs. 2000 w. Am Mach—Vol. 32. No. 20. No. 4772.

Obtaining Accurate Records of Wheel Fits. Illustrates and describes a new American hydraulograph, an instrument which gives the exact pressure used in making force fits. 1200 w. Am Mach—Vol. 32. No. 35. No. 7520.

Making "Under Reamers" for Oil Well Casing. Carroll Ashley. Illustrated description. 1400 w. Am Mach—Vol. 32. No. 36. No. 7702.

Balancing Threshing Machine Cylinders. An illustrated description of a difficult piece of work. 2000 w. Am Mach—Vol. 32. No. 2. No. 1749.

Manufacturing Multiple-Spindle Screw Machines. Illustrated description of the plant and products of the National Acme Mfg. Co., Cleveland, Ohio. 5000 w. Ind Engng—June, 1909. No. 5697 C.

See also Gages, under MEASUREMENT; and Locomotive Repairs, under RAILWAY ENGINEERING, MOTIVE POWER AND EQUIPMENT.

Shops.

The Mesta Machine Company's Plant. Illustrated detailed description of an immense plant at West Homestead, Pa., producing engines, rolling mill machinery, steel castings, etc. 3000 w. Ir Age—Aug. 12, 1909. No. 6999.

Extended Plant of the American La France Fire Engine Company. Plan and illustrated description of the rearranged and extended manufacturing plant. 2500 w. Eng Rec—Sept. 25, 1909. No. 8070.

The Windsor Machine Co.—Examples of Its Shop Practice. Illustrated description of these shops and selected operations. 3500 w. Mach, N Y—Nov., 1908. No. 34 C.

The Curtis Electric Car Truck Plant. Illustrated detailed description of new works at Decatur, Ill. The buildings are fireproof, and the arrangements for handling material are shown. 2500 w. Ir Age—Feb. 18, 1909. No. 2507.

New Wiring-Supplies Building Constructed by the General Electric Company. Illustrated description of a building at Schenectady, N. Y. 1500 w. Elec Rev, N Y—Feb. 27, 1909. No. 2857.

Organization and Equipment of an Automobile Factory. C. B. Owen. Illustrated description of the construction of the Cadillac plant and the design of the product. 5000 w. Mach, N Y—March, 1909. No. 2909 C.

The Phoenix Iron Works of Hartford. E. A. Dixie. Illustrates and describes machine tools built in these old works,

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with something of the history and methods of the works. 2500 w. Am Mach—Vol. 32. No. 24. No. 5569.

The Vail Family and the Speedwell Works. Edward P. Buffet. An account of works near Morristown, N. J., which were recently burned. They were founded in Revolutionary times. 3500 w. Am Mach—Vol. 32. No. 28. No. 6327.

A Modern Tank Works. Illustrations, with description, of works at Shipley, England. 800 w. Engr, Lond—March 19, 1909. No. 3626 A.

A New Oil Engine Works. Brief illustrated description of new works at Hazel Grove, England. 1700 w. Engr, Lond—July 16, 1909. No. 6689 A.

Small Arms and Machine Tool Works. Illustrated detailed description of this department of the St. John's Engineering Works at Erith. 2500 w. Engr, Lond—June 4, 1909. No. 5532 A.

The Woolwich Works of Siemens Bros. & Company, Limited. Illustrated detailed description. 3500 w. Ir & Coal Trds Rev—Oct. 1, 1909. No. 8955 A.

Woolwich Arsenal. Illustrated description of the Royal Arsenal at Woolwich. 3500 w. Ir & Coal Trds Rev—Oct. 1, 1909. No. 8954 A.

New Works at Wolverhampton. Illustrated description of the new plant of Chubb & Son's Lock and Safe Co. 2500 w. Engr, Lond—Oct. 15, 1909. No. 8948 A.

The Cail Works at Denain (Les Ateliers Cail à Denain). Louis Le Châtelier. Illustrated description of these locomotive works. 8500 w. Rev de Métal—May, 1909. No. 5725 E + F.

See also same title, under RAILWAY ENGINEERING, MOTIVE POWER AND EQUIPMENT.

Shop Transportation.

The Shop Transportation Problem. Oscar E. Perrigo. Describes different types of handling devices installed in manufacturing plants. 3000 w. Ind Engng—Sept. 15, 1909. No. 8049 C.

Shop Ventilation.

Ventilation of Factory Buildings in New York State. Information obtained by the State Department of Labor, showing a serious condition. 3500 w. Heat & Vent Mag—Feb., 1909. No. 2742.

Compulsory Factory Ventilation. C. M. Ripley. A justification of the New York State law. 1800 w. Ir Age—July 8, 1909. No. 6215.

MACHINE WORKS AND FOUNDRIES

Tempering

Shop Whistles.

Blowing the Works Whistle Automatically. Frank Sawford. Illustrates and describes the arrangement. 2000 w. Power—Jan. 26, 1909. No. 2088.

Stamp Making.

The Making of Steel Stamps for the Machinist. P. E. Noyes. Illustrates and describes the tools and methods used. 2200 w. Am Mach—Dec. 31, 1908. No. 1402.

Steam Hammers.

Power Hammers and Forging Appliances. James Cran. Calls attention to points needing improvement in steam hammers, and to matters relating to this class of machinery. Ills. 4000 w. Mach, N Y—June, 1909. No. 5177 C.

Straightening Presses.

Spindle Straightening Presses (Ueber Spindelrichtpressen). E. Kühne. A mathematical discussion. Ills. 2000 w. Zeitschr f Werkzeug—Oct. 5, 1908. No. 570 D.

Tack Making.

The Methods of Modern Tack Making. Description of machinery that makes from 300 to 2000 tacks per minute. Ills. 1500 w. Am Mach—Vol. 32. No. 9. No. 2935.

Tap Making.

The Manufacture of Taps. Illustrates and describes methods employed when taps are made in large quantities, describing the works of Wells Bros. Co., at Greenfield, Massachusetts. 5000 w. Mach, N Y—Jan., 1909. Serial, 1st part. No. 1552 C.

Tempering.

Methods of Hardening Steel. E. R. Markham. Discusses methods best for various kinds of work. 2000 w. Mech Wld—Nov. 6, 1908. No. 305 A.

Hardening Carbon and High Speed Steel. Warren E. Thompson. Describes methods used by the author. 1600 w. Am Mach—Vol. 32. No. 1. No. 1621.

Barium Chloride for Hardening Steel. Ethan Viall. Illustrated description of the design of furnace, heating and composition of the barium mixture, cost of operation, and results obtained. 1200 w. Am Mach—Jan. 7, 1909. No. 1624.

The Manufacture of High-Speed Steel. O. M. Becker. An illustrated discussion of the barium-chloride hardening process. 3000 w. Cassier's Mag—May, 1909. No. 4401 B.

The Tempering of High Speed Steel. O. M. Becker. Describes methods used,

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and gives temperature data. 2500 w. Am Mach—Vol. 32, No. 14. No. 3836.

Where, in Relation to the Critical Points, Should Steel Be Heated for the Best Results When Hardening? W. Osborne. Discusses what quenching point will give the best results. 1800 w. Am Mach—Vol. 32, No. 6. No. 2458.

Gaging Heats for Hardening Carbon Steel. James Cran. Brief discussion of effect of carbon content, use of magnetic needle, and related matters. 1500 w. Am Mach—Vol. 32, No. 14. No. 3834.

A Modern English Hardening Room. M. Thornton Murray. Illustrates and describes a typical modern room in a plant at Manchester, England. 2500 w. Am Mach—Vol. 32, No. 13. No. 3653.

High-Speed Steel: A Suggested Theory. Abstract of a lecture by H. C. H. Carpenter on a theory of hardening high-speed tool steel. 2500 w. Ir & Coal Trds Rev—May 7, 1909. No. 4733 A.

See also Furnaces, under MACHINE WORKS AND FOUNDRIES; and Tool Steels, under MATERIALS OF CONSTRUCTION.

Tempering Colors.

A Note on Tempering Colors (Note sur les Couleurs de Revenu). Léon Guillet and Albert Portevin. Cites experiments which show that the colors are a reliable guide in the heat treatment of steel. 1500 w. Rev de Métal—Jan., 1909. No. 2619 E + F.

Tinning.

The Method of Tinning Cast-Iron. Illustrated description. 2500 w. Brass. Wld—Nov., 1908. No. 479.

Old and New Methods of Tinning Metals (Das Verzinnen von Metallgegenständen in alter und neuer Zeit). Otto Vogel. A historical review. 5000 w. Stahl u Eisen—Jan. 13, 1909. No. 2660 D.

Tool Making.

Methods of Making Form Tools and Cutters. E. M. King. Diagrams and description of methods used. 1000 w. Am Mach—Vol. 31. No. 47. No. 360.

Observations on the Making of High-Speed Steel Tools. O. M. Becker. Considers the importance of keeping data, and the kind of data to be kept, as a guide to the production of superior tool steel. 3000 w. Mach, N Y—Sept., 1909. No. 7498 C.

Lathe Kinks. Paul W. Abbott. Gives schemes devised for doing tool work where there was no milling machine or drill press. Ills. 2000 w. Mach, N Y—Feb., 1909. No. 2245 C.

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Tool Rooms.

Tool Room Methods in a Typewriter Factory. F. A. Stanley. Illustrates and describes special machines used for the construction and maintenance of jigs, fixtures and other tools. 3000 w. Am Mach—Vol. 31. No. 50. No. 911.

Tool Rooms for Small Shops. F. C. Myers. Remarks and suggestions for a system of caring for tools. 1400 w. Mech Wld—April 9, 1909. No. 3989 A.

Tools.

Metal Cutting Tools Without Clearance. James Hartness. Describes a turning tool that is intended to cut without clearance, stating its advantages. Plates. 4500 w. Jour Am Soc of Mech Engrs—Dec., 1908. No. 837 F.

See also Tool Steel, under MATERIALS OF CONSTRUCTION.

Tube Making.

The Manufacture of Seamless Steel Tubing. From a lecture by George Lees. Illustrates and describes the processes of drawing tubes from solid steel billets and plates. 4000 w. Ir Trd Rev—Nov. 19, 1908. No. 364.

Plant Used in the Manufacture of Tubes. W. H. A. Robertson. Read before the Inst. of Metals. Describes the more general methods of manufacture. 3000 w. Ir & Coal Trds Rev—Nov. 13, 1908. No. 458 A.

Watchmaking Machinery.

Some Machinery and Methods of Watchmaking. Ethan Viall. Illustrates and describes machinery and methods seen at the plant of the Illinois Watch Co., Springfield, Ill. 3000 w. Mach, N Y—July, 1909. No. 6064 C.

Welding.

Welding. James Cran. Deals principally with welding as it should be done at the forge. Ills. 2500 w. Mach, N Y—Dec., 1908. No. 764 C.

Welding and Brazing, with Special Reference to the Welding of Plates (Das Schweissen und Hartlöten mit besonderer Berücksichtigung der Blechschweissung). A review of welding processes, their applications and advantages. Ills. Serial. 1st part. 2200 w. Glasers Ann—Feb. 15, 1909. No. 3396 D.

Welding and Brazing (Das Schweissen und Hartlöten). Discusses materials, processes, tests of product, etc. Ills. 2500 w. Stahl u Eisen—May 26, 1909. No. 5751 D.

Liquid Gas for Welding and Lighting. E. F. Lake. Illustrates and describes the

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manufacture and properties of the gas, and its uses for welding, lighting, brazing, etc. 2200 w. Am Mach—Vol. 32, No. 16. No. 4105.

Welding Plates by Machine and the Testing of Welded Joints (Das Schweißen von Blechen auf Schweißstrassen und die Prüfung der Schweißnähte). C. Diegel. Describes the process of water-gas welding, its advantages, and results. Ills. 3300 w. Zeitschr d Ver Deutscher Ing—March 13, 1909. No. 4293 D.

Electric Welding. A. E. Buchenberg. Presents the advantages of the electric welding machine over the forge operation. 2000 w. Elec Wld—Dec. 19, 1908. No. 1272.

Welding Metals with Electricity. E. F. Lake. Illustrates and describes machines used, the methods and advantages. 4000 w. Am Mach—Vol. 32. No. 31. No. 6896.

Arc Welding. C. B. Auell. Describes briefly other processes of electric welding, as introductory to a detailed description of the Benardos, or arc welding process. Discussion. Ills. 7000 w. Pro Engrs' Soc of W Penn—May, 1909. No. 5804 D.

Electric Welding in the Boiler Shop. E. A. Dixie. Concerning the comparative costs and strengths of riveted, gas welded and electric welded seams. Ills. 3500 w. Am Mach—Vol. 32. No. 8. No. 2772.

Electric Welding. Illustrated detailed description of machines for electric welding by the Thompson process. 5000 w. Engng—Jan. 15, 1909. Serial, 1st part. No. 2075 A.

Electric Welding. V. D. Green. Abstract of a paper read before the Birmingham & District Elec. Club. Briefly outlines the systems of electric welding in use, particularly describing the system invented by Elihu Thomson. 1800 w. Elect'n, Lond. May 7, 1909. No. 4718 A.

Electric Welding. Abstract of paper by V. D. Green before Birmingham and District Electric Club which discusses various forms of welders. 2000 w. Mech Engr—May 28, 1909. No. 5403 A.

Autogenous Welding. C. B. Auel. Specially describes the use of the oxy-acetylene process. Ills. 5400 w. Elec Jour—Aug., 1909. No. 7025.

Oxy-Acetylene Welding and Cutting. H. R. Cobleigh. Illustrates and describes the process and some applications. 5000 w. Ir Age—Jan. 7, 1909. No. 1501.

The Development of Oxy-Acetylene Welding. Henry Cave. Read before the Int. Acet. Assn. Describes the recent de-

velopment and some of the work accomplished. Ills. 1200 w. Am Mach—Vol. 32. No. 38. No. 8013.

Theory and Practice of Oxy-Acetylene Welding. J. F. Springer. Description of apparatus and operations of the Davis-Bournville system. Ills. 8000 w. Indus Engng—Oct. 15, 1909. No. 8580 B.

Autogenous Welding by the Oxy-Acetylene Flame. Eugene Bournonville. Read before the Tech. Club of Syracuse, N. Y. Brief review of the process, describing the types of torches used. 1000 w. Ir Age—Nov. 26, 1908. No. 455.

Autogenous Welding with Oxy-Acetylene. Henry Cave. Condensed paper read before the Auto. Engrs. of America. Illustrated article describing torches used, methods, etc. 4500 w. Am Mach—Vol. 32. No. 4. No. 2137.

Autogenous Welding as a Means of Repairing Cylinders. Henry Cave. Illustrates and describes repairs made by the use of the oxy-acetylene flame. 1800 w. Mach, N Y—April, 1909. No. 3643 C.

Cylinders Repaired by Autogenous Welding. Henry Cave. Illustrates and describes the work as done with Davis-Bournville apparatus. 1800 w. Ir Age—April 15, 1909. No. 3934.

Autogenous Welding by the Oxy-Acetylene Process. I. F. Willis. Brief explanation of this process and its applications. 1800 w. Pro St Louis Ry Club—April 9, 1909. No. 4544.

Portable Oxy-Acetylene Welding Outfit. E. F. Lake. Illustrated description of the apparatus and its work. 1800 w. Am Mach—Vol. 31. No. 45. No. 124.

Welding with the Oxygenite Process. E. F. Lake. Illustrated description of the apparatus and its operation, illustrating samples of work. 2200 w. Am Mach—Vol. 32. No. 11. No. 3222.

Welding and Cutting Metals with Oxygen (Autogenes Schweißen und Schneiden mit Sauerstoff). Felix Kagerer. A valuable paper describing the use of the oxygen blowpipe in the shops of the Austrian State Railways. Test results and costs. 7700 w. Oest Wochenschr f d Oeffent Baudienst—Feb. 20, 1909. No. 3550 D.

Marine Boiler Repairs by the Oxy-Acetylene Process. James Crombie. Describes repairs recently made on the steamship "Spray I." Ills. 800 w. Boiler Maker—Oct., 1909. No. 8381.

The Repair of Marine Boilers by Autogenous Welding (Schiffskesselreparaturen mittels Acetylen-Sauerstoff-Schweißung). Herr Hilpert. Illustrates and de-

MECHANICAL ENGINEERING

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scribes appliances and methods. Serial. 1st part. 3300 w. Glasers Ann—Jan. 1, 1909. No. 2699 D.

The Application of Autogenous Welding to the Repair of Marine Boilers (Emploi de la Soudure autogène pour la Réparation des Chaudières Marines). André Le Chatelier. A general discussion and a description of methods of repairing certain common failures. Ills. 8300 w. Rev de Métal—Nov., 1908. No. 1107 E + F.

Autogenous Welding of Aluminum. M. U. Schoop. A report of experimental study and success. 2000 w. Elec-Chem & Met Ind—April, 1909. No. 3658 C.

Aluminum Welding. M. U. Schoop. Deals with the applications of autogenous welding and with types of burners especially suitable for welding aluminum. Ills. 1700 w. Elec-Chem & Met Ind. May, 1909. No. 4505 C.

Aluminum Casting Repairs. Henry Cave. Illustrated descriptions of the successful application of the oxy-acetylene blow-pipe. 1200 w. Ir Age—April 22, 1909. No. 4101.

Repair of Aluminum Castings by Oxy-Acetylene. Henry Cave. Illustrates and describes the successful welding of aluminum by this process. 1200 w. Automobile—April 22, 1909. No. 4145.

Thermit Welding. Douglas Waterman. A report of its successful application in the repair of cracked and broken buckets, gear-wheels, and other heavy castings. Ills. 1200 w. Min & Sci Pr—May 22, 1909. No. 5011.

Welding Pipe Work for Superheated Steam. William F. Fischer. Explains the advantages and efficiency of the weld, and describes the processes employed. Ills. 5000 w. Power—Sept. 28, 1909. No. 8143.

Water Decomposition by Direct Current and Alternating Current, and Welding with the Oxy-Hydrogen Flame. M. U. Schoop. Suggestions for making oxy-

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hydrogen gas. 1800 w. Elec-Chem & Met Ind—March, 1909. No. 2984 C.

See also Rail Bending, under STREET AND ELECTRIC RAILWAYS.

Wire Drawing.

The Carroll Friction Block for Wire Drawing Frames. Illustrated description of the device, with record of performance tests. 2000 w. Ir & Coal Trds Rev—March 12, 1909. No. 3431 A.

Woodworking Machinery.

Some Reasons Why Good Saws Fail. J. Mason. Considers some of the causes of failures of this tool. 1800 w. Wood Craft—Feb., 1909. No. 2285.

Woodworking Machines.

A New Mechanical Woodworker. Illustrated detailed description of the machine and its operation. 6500 w. Am Mach—Vol. 32. No. 19. No. 4633.

Universal Dovetailing Machine. Illustrates and describes a new machine for dovetailing boards used for making boxes. 700 w. Engng—Jan. 1, 1909. No. 1709 A.

Wood-Worker. Illustrated description of a wood-working machine of English make. 700 w. Engng—Oct. 8, 1909. No. 8894 A.

The Carstens Cylindrical Shaft on Planers (Dégauchisseuse et Arbre rond de Sécurité "Carstens"). Discusses the efficiency of the Carstens shaft in preventing accidents. Ills. 3500 w. Rev Indus—July 17, 1909. No. 7226 D.

Wrenches.

Classification and Uses of Wrenches. Hubert E. Collins. On the proper names, uses and abuses of wrenches. Ills. 4500 w. Power—Jan. 5, 1909. (Special No.) No. 1480 D.

Wrench Making.

The Making of Spanner Wrenches. Describes the successive operations. Ills. 1200 w. Mach, N Y—Jan., 1909. No. 1553 C.

MATERIALS OF CONSTRUCTION

Alloys.

The Art of Making Alloys. Percy Longmuir. From a paper before the British Foundry Assn., giving practical suggestions. 1200 w. Sci Am Sup—March 13, 1909. No. 3579.

Alloys for Use in the Brass Foundry. Joseph H. Hart. Discusses the results

obtained by alloying various metals. 2500 w. Foundry—March, 1909. No. 2943.

Some Physical Characteristics of Iron Alloys. Charles F. Burgess and James Aston. Reports results of an investigation being conducted in the laboratories of the Univ. of Wis. testing the forgeability, welding, and machining of prac-

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tically carbon-free iron alloys. 2000 w. Elec-Chem & Met Ind—Oct., 1909. No. 8330 C.

"Ferro-Bronzes." Robert Grimshaw. Describes some new alloys and their composition. 1200 w. Sci Am Sup—April 24, 1909. No. 4115.

Increasing the Tensile Strength of Aluminum-Bronze and Muntz-Metal by Quenching. Erwin S. Sperry. Gives report of tests showing the effect of quenching. Ills. 1200 w. Brass Wld—Jan., 1909. No. 1839.

The Plastic-Bronze Patent Situation. G. H. Clamer. An account of the suit against the Brady Brass Co., and Judge Archbold's decision; the appeal and Judge Grays decision. 2500 w. Brass Wld—May, 1909. No. 4749.

Monel Metal. David H. Browne. A brief description of its properties and uses. 1000 w. Elec-Chem & Met Ind—March, 1909. No. 2985 C.

I. Monel Metal. Dr. A. Stansfield. II. Report on Tests of Monel Metals. Prof. E. Brown. Two papers discussed together. Ills. The papers deal with the metallurgy and physical properties of this product. 8000 w. Can Soc of Civ Engrs, Bul. 5—May, 1909. No. 5855 N.

Special Copper Alloys (Les Alliages de Cuivre spéciaux). Jean Escard. Discusses bronzes and brasses containing manganese, silicon, chromium, tungsten and vanadium. Ills. Serial. 1st part. 3000 w. Génie Civil—May 22, 1909. No. 5741 D.

Veeder Alloy (Veeder-Guss). Describes the properties of a cast tin alloy used in the manufacture of Veeder cyclometers. Ills. 2500 w. Giesserei-Zeit—June 1, 1909. No. 6568 D.

See also Bearing Metals; Manganese Bronze, and Solders, under MATERIALS OF CONSTRUCTION.

Alloy Steels.

The Nature and Treatment of Alloy Steel. Dr. John A. Mathews. General information relating to the construction of alloy steels, the problems involved, and precautions necessary. 2500 w. Ir Age—Jan. 7, 1909. No. 1496.

The Nature and Characteristics of the New Steels. O. M. Becker. The present article deals with the physical constituents of steel and the nature of hardening. Ills. 5000 w. Engineering Magazine—Feb., 1909. No. 2160 B.

The Nature and Characteristics of the New Steels. O. M. Becker. Second and

concluding paper, dealing with the influence of each of the ordinary alloy elements on the properties of steel. 5000 w. Engineering Magazine—March, 1909. No. 2787 B.

Alloy Steels for Motor-Car Construction. John A. Matthews. Considers certain economic features in connection with the manufacture, purchase, use, and treatment of alloy steels. 6500 w. Jour Fr Inst—May, 1909. No. 4763 D.

High-Tension Steels. Percy Longmuir. Read before the I. and S. Inst. Gives results of experiments made with a view to deciding on the most serviceable type of steel for high-tension and endurance purposes. 2500 w. Ir & Coal Trds Rev—May 14, 1909. No. 5130 A.

Notes on Properties of Steel Alloys and Steels. Gordon Surr. Discusses the influence of alloy elements. 3000 w. Min Wld—June 19, 1909. No. 5672.

Special Industrial Steels (Les Aciers spéciaux industriels). Léon Guillet. Read before the Congress of Applied Chemistry. Discusses the characteristics conferred by various alloys. 2000 w. Rev de Métal—June, 1909. No. 6517 E + F.

Special Steels. Leon Guillet. Reviews recent developments in their manufacture. Read at Copenhagen meeting of Int. Soc. for Test. Mat. 2500 w. Ir Age—Sept. 23, 1909. No. 8002.

Qualities and Characteristics of the New Steels (Beschaffenheit und Charakteristik der neuen Stahlorten). W. Heym. Gives in brief form the qualities imparted to steel by the addition of the alloy metals. Serial. 1st part. 1800 w. Geisserei-Zeit—Sept. 15, 1909. No. 8659 D.

The Influence of Nickel and Carbon on Iron (Der Einfluss von Nickel und Kohlenstoff auf Eisen). G. Goldberg. A review of the results obtained and the conclusions reached by various investigators. Ills. 2600 w. Serial, 2 parts. Giesserei-Zeit—March 15, and April 1, 1909. No. 4255 each D.

The Properties of Nickel Steel (Zur Kenntnis der Festigkeitseigenschaften des Nickelstahles). Gives results of tests of the strength of nickel steels of various compositions and under various conditions. Ills. 1400 w. Stahl u Eisen—March 24, 1909. No. 4252 D.

Nickel Steel Spoiled by Forging at Too High a Temperature (Durch zu hohe Schmiedehitze verdorbenes Nickelfluss-eisen). E. Heyn and O. Bauer. Results of investigations of its properties. Ills. 1500 w. Stahl u Eisen—April 28, 1909. No. 4862 D.

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The Commercial Use of Vanadium. T. F. V. Curran. Information concerning its use and the results secured. 1500 w. Ir Trd Rev—Nov. 13, 1908. No. 365.

Vanadium and Its Estimation. George Auchy. Discusses whether or not vanadium is all that is claimed, the tests needed, and related matters. 3000 w. Ir Age—Nov. 12, 1908. No. 215.

The Importance of Vanadium in the Iron and Steel Industry (Das Vanadium und seine Bedeutung für die Eisen- und Stahlindustrie). A. Haenig. An exhaustive discussion of vanadium ores, mining, metallurgy and alloys. Serial, 1st part. 2800 w. Zeitschr d Mitt Motorwagen Ver—July 31, 1909. No. 7292 D.

Effect of Titanium Alloy on Steel. Charles V. Slocum. Gives results obtained at various steel plants. Ills. 2500 w. Ir Trd Rev—Feb. 25, 1909. No. 2769.

Manganese Steel. W. S. Potter. Considers its physical properties, heat treatment, rolling, testing, etc. General discussion. Ills. 9500 w. Jour W Soc of Engrs—April, 1909. No. 4788 D.

Manganese Steel (L'Acier au Manganèse). A letter from Schneider & Co. taking exception to a recent article on manganese-steel rails in *The Iron Age*, and a description of results obtained by this firm. Ills. 6000 w. Rev de Métal—May, 1909. No. 5724 E + F.

An Investigation of Tantalum Steels. A detailed report of the experiments, with micrographs. 2500 w. Ir & Coal Trds Rev—June 11, 1909. No. 5665 A.

The Constitution of Carbon-Tungsten Steels. Thomas Swinden. Read before the Ir. & St. Inst. A continuation of research work previously reported. Ills. 7500 w. Ir & Coal Trds Rev—Oct. 1, 1909. No. 8952 A.

See also Gears, under AUTOMOBILES, and MACHINE ELEMENTS AND DESIGN; Electro-Metallurgy, under MINING AND METALLURGY, IRON AND STEEL; and Rails, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS.

Aluminium.

See same title, under MINING AND METALLURGY, MINOR MINERALS; and Aluminium Castings, under MACHINE WORKS AND FOUNDRIES.

Bakelite.

Bakelite. Abstract of a paper by Dr. L. H. Bakeland, before the Am. Chem. Soc. giving information concerning the manufacture and properties of this new substance. 2500 w. Elec-Chem & Met Ind—March, 1909. No. 2983 C.

MATERIALS OF CONSTRUCTION

Bearing Metals.

The Problem of Bearing Metals. Samuel K. Patteson. A general review of the present bearing metal situation. 2000 w. Elec-Chem & Met Ind—Jan., 1909. No. 1680 C.

Bearing Metal. Joseph H. Hart. Considers the qualities of a good bearing metal, their composition, and matters related. 2000 w. Mach, N Y—Aug., 1909. No. 6805 C.

Anti-Friction Alloys for Bearings. A. H. Hiorns. Read before the Birmingham Assn. of Mech Engrs. A study of the qualities required for an anti-friction alloy, and the essential points to be considered in a bearing metal. 4000 w. Mech Engr—Dec. 25, 1908. No. 1506 A.

Bearing Metals. A. Hague. Abstract of paper read before the Staffordshire Ir. & St. Inst. Divides the bearing metals into rigid bronzes, plastic white metals, and the plastic bronzes, considering each separately. 3500 w. Ir & Coal Trds Rev—Feb. 5, 1909. No. 2495 A.

Brass.

Cold Working and Tension Tests (Kaltbearbeitung und Zugversuch). R. Striebeck. Gives results of extended tests on brasses. Ills. 7000 w. Zeitschr d Ver Deutscher Ing—Feb. 13, 1909. No. 3561 D.

Ingoted Scrap Brass and Bronze. Walter J. May. Brief discussion of its preparation and use. 800 w. Prac Engr—June 18, 1909. No. 6031 A.

Brasses and Copper (Laitons et Cuivre). Charles Grard. Describes mechanical tests, heat-treatment investigations and metallographic examinations. Ills. Serial, 1st part. 10000 w. Tech Mod—June, 1909. No. 6540 D.

Bronze.

Composition of the Modern Bronzes. C. Vickers. Read before the Pittsburg Found. Assn. Discusses the dioxiding elements used in copper alloys for increasing their tensile strength and ductility. 2500 w. Foundry—Feb., 1909. No. 2253.

Notes on Phosphor Bronze. A. Philip. Read before the Inst. of Metals. A record of results of tests to obtain information in regard to chemical specification for this material. Also effect of treatment, etc. 3500 w. Ir & Coal Trds Rev—Nov. 13, 1908. No. 457 A.

On the Magnetic Properties of Certain Copper Alloys. A. D. Ross and R. C. Gray. Gives a report of research work on aluminium and manganese bronzes and on the constituent metallic elements.

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Bronze

1500 w. Elect'n, Lond—Aug. 6, 1909. No. 7092 A.

Japanese Bronzes (Japanische Bronzen). Paul Martell. A discussion of the composition and manufacture of these alloys. 2500 w. Giesserei-Zeit—March 1, 1909. No. 4254 D.

The Influence of Heat Treatment on Copper Alloys (Influence des Traitements thermique sur les Alliages de Cuivre). A. Portevin. Read before the Congress of Applied Chemistry. Results of experiments indicating that the properties of bronzes can be altered by heat treatment. 2400 w. Rev de Métal—June, 1909. No. 6518 E + F.

Cast Iron.

Carbon and the Properties of Cast Iron. Henry M. Howe. The difference in the properties is considered to be due to the distribution of its carbon between the graphitic and combined states. 4000 w. Eng & Min Jour—Nov. 14, 1908. No. 256.

Twenty-Five Years of Cast Iron. Prof. Thomas Turner. Abstract of paper read before the British Found. Assn. A summary of work done in Birmingham, Eng., during the last quarter-century. 5500 w. Mech Wld—Aug. 13, 1909. No. 7323 A.

Effect of Structure of Cast Iron Upon Its Physical Properties. F. J. Cook and G. Hailstone. Gives microscopic evidence of the reason why irons of similar chemical composition have different relative strengths. Ills. 1800 w. Foundry—Sept., 1909. No. 7606.

Influence of Chemical-Compounds on the Properties of Cast Iron. A. H. Hiorns. Read before the British Found. Assn. Considers the influence of the usual elements found in cast iron. 3500 w. Mech Engr—Aug 6, 1909. No. 7095 A.

Influence of Chemical Compounds on the Properties of Cast Iron. A. H. Hiorns. Read before the British Found. Assn. Investigates the influence of chemical compounds on soundness of castings. 2000 w. Mech Wld—Oct. 8, 1909. Serial. 1st part. No. 8885 A.

The Influence of Foreign Elements on the Strength of Cast Iron (Der Einfluss der Fremdkörper auf die Festigkeitseigenschaften des Gusseisens). Max Orthey. Discusses the effect of the various impurities commonly found. Serial. 1st part. 1500 w. Giesserei-Zeit—Jan. 1, 1909. No. 2683 D.

The Distribution of the Impurities in Cast Iron (Ueber die Verteilung der Fremdkörper im Gusseisen). Max Orthey. Results of an experimental study.

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Serial, 1st part. 1500 w. Giesserei-Zeit—May 1, 1909. No. 5761 D.

Tests of Cast Iron. E. Adamson. Read before the Ir. & St. Inst. A report of comparative tests made to arrive at the differences in results under varying working conditions. 2000 w. Engng—Oct. 15, 1909. No. 8935 A.

Tests of Cast Iron (Versuche mit Gusseisen). C. Bach. Gives results of bending, tension and impact tests. Ills. Serial, 1st part. 4400 w. Zeitschr d Ver Deutscher Ing—Dec. 26, 1908. No. 2106 D.

The Testing of Cast Iron (Beitrag zur Prüfung des Gusseisens). C. Jüngst. Discusses test bars and gives comparative test results on bars of various shapes and sizes. Ills. 3000 w. Stahl u Eisen—Aug. 4, 1909. No. 7949 D.

The "Growth" of Cast Irons after Repeated Heatings. Prof. H. F. Rugan, and Prof. H. C. H. Carpenter. Read before the Ir. & St. Inst. Ills. 18500 w. Ir & Coal Trds Rev—Oct. 1, 1909. No. 8953 A.

The "Growth" of Cast Iron After Repeated Heatings. An account of recent investigations in Great Britain, with comments by A. E. Outerbridge, Jr. 4000 w. Ir Age—Oct. 7, 1909. No. 8377.

The Use of Vanadium in Cast Iron. J. Kent Smith. Explains the action of this metal on grey iron for casting purposes and methods of application in the ladle and air furnaces. 3000 w. Foundry—Feb., 1909. No. 2251.

Composition of Automobile Cylinders. Harry B. de Pont. Gives experience with various grades of iron. 2500 w. Foundry—Nov., 1908. No. 51.

Effect of Permanent Molds on Iron. Edgar Allen Custer. Read before the Am. Soc. for Test. Mat. An illustrated discussion of the peculiar properties imparted to cast iron by the use of permanent molds. 2000 w. Foundry—Aug., 1909. No. 6817.

See also Test Bars, under MEASUREMENT.

Cast Steel.

See Castings, under MACHINE WORKS AND FOUNDRIES.

Copper.

Copper and Copper Alloys. J. T. Milton. Abstract of paper read before the Inst. of Metals. Discusses points in relation to these metals, about which reliable information is desired. 4500 w. Mech Engr—Nov. 27, 1908. No. 855 A.

Fatigue of Copper Pipes. James M. Allan. Abstract of paper read before the

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Metallography

N.-E. Coast Inst. of Engrs. and Shipbldrs. Describes tests made, reporting results. Ills. 4000 w. Mech Engr—Feb. 5, 1909. No. 2479 A.

Fatigue of Copper Pipes. James M. Allan. A report of experimental investigations. Plates. Discussion. 7500 w. Trans N-E Coast Inst of Engrs & Shipbldrs—March, 1909. Serial, 1st part. No. 3954 N.

The Characteristics of Copper Under Various Conditions. George W. Handscomb. Abstract of paper read before the Inst. of Marine Engrs. Deals with the manipulation of this metal at the hands of the copper worker. 2500 w. Ir & Coal Trds Rev—March 26, 1909. Serial, 1st part. No. 3820 A.

Corrosion.

See same title, under ELECTRICAL ENGINEERING, ELECTRO-CHEMISTRY.

Elastic Breakdown.

The Elastic Breakdown of Materials. Submitted to Compound Stresses. L. B. Turner. The present number gives an introductory, critical review of investigations in this field, and will be followed by results of experiments by the author. 3300 w. Engng—Feb. 5, 1909. Serial. 1st part. No. 2485 A.

Galvanized Metals.

The Testing of Galvanized and Other Zinc-Coated Metals. William H. Walker. Condensed from a paper before the Am. Soc. for Test Mat. Describes tests made, stating their value. 2500 w. Eng News—Sept. 2, 1909. No. 7540.

Hardness.

The Influence of Heat on the Hardness of Metals (Untersuchungen über den Einfluss der Wärme auf die Härte der Metalle). Alfred Kürth. Describes and gives the results of recent extensive researches. Ills. Serial, 1st part. 6600 w. Zeitschr d Ver Deutscher Ing—Jan. 16, 1909. No. 2836 D.

Heat Insulation.

Underground Insulation of Steam and Hot Water Pipes. Harry Gillett. A brief discussion of pipe-coverings. 1200 w. Ohio Soc of Mech, Elec, & Steam Engrs, No. 144—Nov., 1908. No. 907 N.

The Thermal Conductivity of Heat-Insulators. A review of the research work of Dr. Wilhelm Nusselt. 3300 w. Engng—Jan. 1, 1909. No. 1703 A.

The Practical Efficiency of Heat-Insulating Materials. Charles R. Darling. Gives a summary of results obtained dur-

ing a series of tests on commercial laggings, and the conclusions reached. 2000 w. Engng—July 9, 1909. No. 6422 A.

Heat Insulating Materials. A new method of determining their value, explained in an article by Wilhelm Nusselt, in the *Zeit. für die Gesamte Kälte Ind.* 2000 w. Ice & Cold Storage—April, 1900. Serial, 1st part. No. 3888 A.

See also same title, under MEASUREMENT.

Lead.

Lead (Bijdrage tot de Kennis van het Lood). H. Baucke. A metallographic study of lead. Ills. 5200 w. De Ingenieur—Feb. 20, 1909. No. 3574 D.

Experiments on the Tempering of Lead and the Corresponding Changes in Hardness (Quelques Expériences sur la Trempe du Plomb et les Changements corrélatifs de sa Dureté). M. Loutchinnsky. Gives the results of tests. Ills. 2000 w. Rev de Métal—May, 1909. No. 5723 E + F.

Manganese Bronze.

Making Manganese Bronze. K. Kinn. Suggestions for making this alloy. 2000 w. Am Mach—Vol. 32. No. 4. No. 2139.

Metallography.

Metallographs, or Photographs of the Structure of Metal Specimens. J. F. Springer. An illustrated explanation of their value in the study of metals. 1700 w. Sci Am—Nov. 7, 1908. No. 106.

Microscopic Metallography and Its Employment in French Industries. Jacques Boyer. An illustrated detailed description of the practice followed in the leading establishments. 5500 w. Engineering Magazine—Jan., 1909. No. 1332 B.

The Mysteries of Metals. Abstract of a lecture by Prof. J. O. Arnold, the first of a course at the Royal Inst. Ills. 2500 w. Engng—Jan. 29, 1909. Serial, 1st part. No. 2359 A.

The Application of the Microscope to the Study of Metals. Walter Rosenhain. An outline of the methods of studying metals and alloys with the microscope. Ills. Discussion. 6500 w. Jour Soc of Arts—March 12, 1909. No. 3400 A.

Metallography of Steel. O. F. Hudson. Read before the Birmingham Assn. of Mech. Engrs. Considers the effect of heat treatment on steel and the importance of microscopic testing. 3000 w. Mech Engr—April 9, 1909. No. 4031 A.

Microscopy and Macroscopy in the Workshop and Foundry. Abstract of a lecture by J. E. Stead, at Copenhagen,

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giving examples of cases where both macroscopy and microscopy had been found of service in testing steel. 2000 w. *Ir & Coal Trds Rev*—Sept. 17, 1909. Serial. 1st part. No. 8136 A.

Transparency of Metals. J. Horton. Considers experimental study of the optical phenomena of thin metallic films. 1000 w. *Cassier's Mag*—April, 1909. No. 3640 B.

The Metallography of Iron Clarified. Henry M. Howe. A new theory as to the nature of the martensite needle structure which also simplifies the metallography of iron. Ills. 4500 w. *Elec-Chem & Met Ind*—Oct., 1909. No. 8327 C.

The Examination of Metals (Ueber Metallforschung). H. Winter. A review of the general principles of the microscopic examinations of metals, with examples of metallographic studies. Ills. 4800 w. *Glückauf*—March 27, 1909. No. 4266 D.

The Metallography of Tempered Steels (Remarques au Sujet des Mémoires de M. Kourbatoff et de M. Maurer sur la Métallographie des Aciers trempés). Carl Benedicks. A discussion of papers by M.M. Kourbatoff and Maurer. 3500 w. *Rev de Métal*—April, 1909. No. 4821 E + F.

Researches on the Alloys of Iron and Sulphur (Recherches sur les Alliages du Fer avec le Soufre). M. Ziegler. An exhaustive metallographic and chemical study. Ills. 13500 w. *Rev de Mécan*—April, 1909. No. 4820 E + F.

The Industrial Applications of Metallography (Les Applications de la Métallographie à l'Industrie). Louis Revillon. Read before the Congress of Applied Chemistry. 1700 w. *Rev de Métal*—June, 1909. No. 6519 E + F.

The Structure of Steels at High Temperatures (Sur la Structure des Aciers aux Températures élevées). M. A. Baykoff. Results of experiments to determine the nature of austenite. Ills. 1000 w. *Rev de Métal*—July, 1909. No. 7200 E + F.

Metallographic Examination of Some Semi-Steels (Examen micrographique de quelques Fontes de Moulage dites "Acier-euses"). Jean Guillemin. Illustrates and describes their structure. 1500 w. *Rev de Métal*—Sept., 1909. No. 8606 E + F.

Researches on Tempering and Annealing Iron and Steel (Recherches sur la Trempe et le Revenu du Fer et de l'Acier). Ed. Maurer. An extensive study of changes in physical, chemical and metallographic properties in the heat treat-

ment of iron and steel. Ills. 11000 w. *Rev de Métal*—Oct., 1908. No. 513 E + F.

A Contribution to the Metallographic Study of Tempered Steels (Contribution à l'Étude Métallographique des Aciers Trempés). M. Kourbatoff. Discusses the transformations of austenite and troostite. Ills. 2000 w. *Rev de Métal*—Oct., 1908. No. 512 E + F.

A New Polishing Machine for Metallographic Work. James Aston. Describes a machine devised in the Chem. Engng. Dept. of the Univ. of Wisconsin. 800 w. *Elec-Chem & Met Ind*—Jan., 1909. No. 1677 C.

Polishing Metals for Examination With the Microscope. Albert Kingsbury. Describes the method finally adopted by the author. 1500 w. *Jour Am Soc of Mech Engrs*—May, 1909. No. 4409 F.

Alumina for Polishing (Alumine de Polissage). M. Robin. Discusses materials for polishing specimens for metallographic study. Ills. 2000 w. *Rev de Métal*—Oct., 1908. No. 514 E + F.

Lecture on "Composition and Constitution." Edward F. Law. On the importance of amplifying ordinary analysis by a structural and constitutional analysis. 2 plates. 3500 w. *Jour W of Scotland Ir & St Inst*—Nov. and Dec., 1908. No. 2430 N.

The Behavior of Metals Under Stress. Prof. Chapman. Presidential address on the microstructure of metals, their fatigue and the scientific side of engineering practice. 3500 w. *Aust Min Stand*—Feb. 24, 1909. Serial, 1st part. No. 3880 B.

The Fatigue and Crystallization of Metals. Walter Rosenhain. Reviews evidence that metals are aggregates of crystals, discussing the conditions affecting the size of the crystals and their formation, and explaining "fatigue" failure. Discussion. Ills. 7000 w. *Jour W of Scotland Ir & St Inst*—Feb, 1909. No. 6456 N.

The Magnetic Properties of Iron and the Study of Metals and Alloys (Le Ferromagnétisme et l'Étude des Métaux et Alliages). Pierre Weiss. Read before the Congress of Applied Chemistry. A discussion of the importance of magnetic properties in the study of metallographic problems. Ills. 6500 w. *Rev de Métal*—June, 1909. No. 6508 E + F.

Inaugural Address on the Crystallization of Iron and Steel. A. McArthur Johnston. Deals mainly with the size of the crystals in iron and steel and the effect on these of heat treatment, mechanical treatment, and of the strains and stresses set up during work. A microscopic study.

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Supplement of Ills. 8000 w. Jour Chem, Met, & Min Soc of S Africa—July, 1909. No. 7843 E.

Krupp Cemented Armor Plate Under the Microscope (La Corazza "Krupp cementata" esaminata al Microscopio). Ugo F. Gregoretti. A metallographic study. Ills. 5000 w. Riv Marit—Nov., 1908. No. 1127 E + F.

Lieutenant-Colonel Caron (Le Lieutenant-Colonel Caron). Paul Nicolardot. A sketch of his life and of his contributions to the science of metallurgy. Ills. 28000 w. Rev de Métal—Jan., 1909. No. 2615 E + F.

Researches on the Sub-Oxides of Cæsium (Recherches sur les Sous-Oxydes de Cæsium). M. Rengade. An investigation of the solution of metallic oxides in fused metals. Ills. 5000 w. Rev de Métal—Sept., 1909. No. 8605 E + F.

See also Cooling Curves, Laboratories, and Testing Methods, under MEASUREMENT; Lead, and Steel, under MATERIALS OF CONSTRUCTION; and Alloys, under MINING AND METALLURGY, MISCELLANY.

Packings.

Metallic Packings. Describes some of the best known packings of this type, illustrating their general features. 2000 w. Prac Engr—July 30, 1909. Serial, 1st part. No. 6967 A.

Refractory Materials.

See Blast-Furnace Lining, under MINING AND METALLURGY, IRON AND STEEL.

Solders.

Solders and Fusible Alloys. H. F. Blake. Gives the composition and melting point of the most generally used solders and information relating to them. 1200 w. Am Mach—Vol. 32. No. 23. No. 5388.

Solders and Fusible Alloys. S. K. Paterson. Their composition, action, utilization, etc., are discussed. 1800 w. Mech Wld—March 26, 1909. No. 3783 A.

Standardization.

See Shipbuilding, under MARINE AND NAVAL ENGINEERING.

Steel.

Benefits Derived by Heat-Treating Steel. Thomas J. Fay. Aims to explain methods by which good steel may be fashioned into shape and then rendered hard or soft, ductile or dynamic, as the service may demand. 3300 w. Automobile—Nov. 26, 1908. Serial. 1st part. No. 621.

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Heat Treatment of Carbon Steel. J. H. Gill. Describes method and its application. 1200 w. Am Mach—Vol. 31. No. 50. No. 910.

High-Tensile Steel Compared with Mill Steel. Extracts from report of Prof. Archibald Barr concerning an extensive series of experiments recently carried out to determine the relative qualities. 2000 w. Ir & Coal Trds Rev—Dec. 18, 1908. Serial, 1st part. No. 1381 A.

The Modulus of Elasticity of High Tensile and Mild Steels. Describes recent experiments made by David Colville and Sons, Ltd., giving results. 1600 w. Mech Engr—Jan. 8, 1909. No. 1812 A.

The Shearing Resistance of Mild Steel in Punching. Y. Sekiguchi. A report of tests. 500 w. Am Mach—Vol. 32. No. 10. No. 3083.

The Present Value of Electrical Structural Steel. Henry D. Hibbard. Read before the Am. Elec.-Chem. Soc. Compares electric steel with steel made by the Bessemer and open hearth processes. 2000 w. Ir Trd Rev—May 13, 1909. No. 4643.

A Heat Treatment Study of Bessemer Steels. Andrew McWilliam and Ernest J. Barnes. Read before the I. and S. Inst. An account of investigations carried out at Sheffield University, Eng. 5000 w. Ir & Coal Trds Rev—May 14, 1909. No. 5127 A.

The Heat Treatment of Spring Steel. Lawford H. Fry. Read at the Copenhagen Congress of the Int. Soc. for Test. Mat. An account of a series of tests made at the Baldwin Locomotive works to determine the effect of certain heat treatments. 2500 w. Ir Age—Oct. 7, 1909. No. 8375.

The Ageing of Mild Steel and the Influence of Nitrogen. C. E. Stromeyer. Read before the I. and S. Inst. A report of research work in regard to failures in steel. 4500 w. Ir & Coal Trds Rev—May 14, 1909. No. 5128 A.

The Chemical Physics Involved in the Decarburization of Iron-Carbon Alloys. W. H. Hatfield. Read before the I. and S. Inst. Reviews briefly the experimental work reported by different investigators, describing the writer's experiments and stating results. Ills. 3500 w. Ir & Coal Trds Rev—May 14, 1909. No. 5129 A.

Influence of the Treatment on the Solubility of Steel in Sulphuric Acid, and Deductions Therefrom as to the Nature of the Treatment to Which the Material Has Been Previously Subjected. E. Heyn and O. Bauer. (Abstract). Read be-

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fore the I. and S. Inst. Ills. 6000 w. Ir & Coal Trds Rev—May 14, 1909. No. 5137 A.

Tenacity and Malleability. William Misangyi. Presented at Cong. Int. Assn. for Test. Materials. Report of investigations on iron bars, and conclusions. 1600 w. Ir Trd Rev—Oct. 14, 1909. No. 8568.

The Elasticity and Fatigue of Wrought Iron and Steel. Henry S. Pritchard. Explains these terms as applied to metals, and the phenomena, giving results of experimental study of stresses, overstrain, etc. 5000 w. Ind Engng—April, 1909. No. 4075 C.

The Hardness of Steel at Different Temperatures (La Dureté à Chaud des Aciers). M. Robin. Reports the results of careful tests on various steels at temperatures from 0 to 700 degrees C. Ills. 5000 w. Rev de Métal—Dec., 1908. No. 1909 E + F.

The Hardness of Steels at Low Temperatures (La Dureté des Aciers aux basses Températures) M. F. Robin. Gives the results of an experimental investigation of various steels. Ills. 4000 w. Rev de Métal—Feb., 1909. No. 3306 E + F.

An Additional Note on the Hardness of Heated Steel (Note additionelle au Mémoire sur la Dureté à Chaud des Aciers). M. F. Robin. Ills. 500 w. Rev de Métal—Feb., 1909. No. 3307 E + F.

Grinding Sparks of Steel. Max Bermann. Read at Copenhagen meeting of the Int. Soc. for Test. Mat. Explains how they may become a basis of classification. Ills. 3000 w. Ir Age—Sept. 23, 1909. No. 8003.

Sparks as an Indication of the Qualities of Steel (Die Funken als Erkennungszeichen der Stahlsorten). Max Bermann. A discussion of what may be deduced concerning the qualities and composition of steels from the sparks made in grinding. Ills. 6500 w. Zeitschr d Ver Deutscher Ing—Jan. 30, 1909. No. 2841 D.

Sparks as an Indication of the Quality of Steel (Die Funken als Erkennungszeichen der Stahlsorten). Discussion and criticism of M. Bermann's paper in the *Zeitschrift des Vereines Deutscher Ingenieure* for January 30, 1909. Ills. 4500 w. Stahl u Eisen—July 21, 1909. No. 7262 D.

The Influence of Heat Treatment on the Linear Deformations of Steels (Influence du Traitement thermique sur les Déformations linéaires des Aciers). M. Demozay.

Results of extended tests on steels of various compositions. Ills. 10500 w. Rev de Métal—April, 1909. No. 4818 E + F.

The Heat Treatment of Steel (Remarques sur les Traitements Thermiques des Produits sidérurgiques). Léon Guillet. Read before the Congress of Applied Chemistry. Calls attention particularly to the importance of the time element. 1300 w. Rev de Métal—June, 1909. No. 6516 E + F.

The Appearance of Fractures and the Quality of Materials (Bruchaussehen und Materialbeschaffenheit). O. Bauer. Experimental data on the estimation of the quality of steel by the grain of the fracture. Ills. 1400 w. Stahl u Eisen—Sept. 1, 1909. No. 8648 D.

See also Metallography, under MATERIALS OF CONSTRUCTION; and Boiler Design, under STEAM ENGINEERING.

Timber Drying.

Kiln Drying Lumber. Charles L. Hubbard. Discusses the drying of lumber by artificial means, describing various kinds of apparatus used. Ills. 2000 w. Dom Engng—July 17, 1909. Serial, 1st part. No. 6432.

Tool Steels.

The Manufacture and Use of High-Speed Steel. O. M. Becker. Illustrated description of methods of making high-speed tools. 3000 w. Cassier's Mag—Dec., 1908. No. 951 B.

The Manufacture of High-Speed Steel. O. M. Becker. Discusses the practical application of the high-heat treatment to hardening. Ills. 7000 w. Cassier's Mag—Feb., 1909. No. 2328 B.

The Newer High-Speed Steels. O. M. Becker. Gives the composition of recent tool steels, explaining their lasting qualities and usefulness. 1500 w. Mach, N Y—June, 1909. No. 5179 C.

Range of Utility of High Speed Steel. O. M. Becker. Considers applications to meet special and peculiar conditions, cost, improvement in performance, etc. 3500 w. Ir Trd Rev—Sept. 9, 1909. Serial. 1st part. No. 7678.

High-Speed Tool Steels. An account of actual tests carried out at several Sheffield works. 2500 w. Engr, Lond—March 19, 1909. No. 3625 A.

High-Speed Steel. A report of tests made at Nash's Test House, Sheffield, England. 700 w. Engr, Lond—April 2, 1909. No. 3911 A.

Remarkable Facts in Tempering Tool Steels. Albert F. Shore. A valuable ar-

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ticle giving data disclosed by the scleroscope and compound-stress machine. Ills. 5500 w. *Am Mach*—Vol. 32, No. 6. No. 2461.

Buying Carbon Tool Steel on Specification. J. M. Darke, in *Gen. Elec. Rev.* Gives the specifications drawn, and explains the advantages. 1500 w. *Ir Age*—Aug. 12, 1909. No. 7002.

Buying Carbon Tool Steel on Specifications. J. M. Darke. From the *Gen. Elec. Rev.* Gives the specifications drawn up, with a brief statement of methods of chemical analyses. 2000 w. *Am Mach*—Vol. 32. No. 30. No. 6760.

U. S. Navy Specifications for Tool Steel. Henry Williams. Concerning the chemical composition and physical characteristics adopted by the Navy for purchase of tool steel. 4000 w. *Am Mach*—Vol. 32. No. 30. No. 6758.

Tool Steel Specifications for the United States Navy. Gives the reports submitted by the Board on tool steel, dealing with the qualities, shapes, sizes, different brands, and reasons in each

MEASUREMENT

Dynamometers

case. 6000 w. *Iron Age*—Aug. 12, 1909. No. 7001.

A Tool-Steel Testing Machine and Results. Edward G. Herbert. Illustration, with description of the principle and construction of the machine and report of results. 7500 w. *Am Mach*—Vol 32. No. 20. No. 4774.

The Testing of Files and Tool Steel. Edward G. Herbert. Read before the Manchester Assn. of Engrs. Shows the importance of file testing in workshop economy, and illustrates and describes a machine used in making the tests, giving results, efficiency, etc. 6000 w. *Mech Engr*—April 2, 1909. Serial, 1st part. No. 3901 A.

Wire Rope.

The Application of Wire Rope to Transportation. Discusses the systems in use, with notes on the care and types of wire rope. 8500 w. *Ind Engng*—June, 1909. No. 5699 C.

Wrought Iron.

See Steel, under MATERIALS OF CONSTRUCTION.

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Air Meters.

The Measurement of Compressed Air. Prof. J. Orr. Read before the Trans. Inst. of Mech. Engrs. Illustrated description of meters for determining the amount of air at every temperature, passing through the meter. 2000 w. *Mech Engr*—July 16, 1909. Serial, 1st part. No. 6665 A.

Brakes.

Prony Brakes for Practical Testing. G. Everett Quick. Illustrates and describes different forms of friction brakes and their application and operation. 3000 w. *Power*—Nov. 17, 1908. No. 291.

Calorimeters.

An Automatic Calorimeter (Automatisches Kalorimeter). Herm. F. Lichte. Describes the principle and operation of the Junker continuous recording calorimeter. Ills. 1500 w. *Giesserei-Zeit*—March 15, 1909. No. 4256 D.

Calorimetry.

Report of Sub-Committee on Calorimetry. Report presented at the Oct. meeting of the Am. Gas Inst., with illustrated descriptions of types of calorimeters, and short discussion. 17000 w. *Pro Age*—Feb. 15, 1909. No. 2456.

A New Bomb Calorimeter. Charles J. Emerson. Illustrated description of a new bomb of the Berthelot type. 1000 w. *Jour Ind & Engng Chem*—Jan., 1909. No. 2040 E.

Calorimetry, and the Determination of the Calorific Value of Philippine and Other Coals from the Results of Proximate Analysis. Alvin J. Cox. Discusses methods of determination, giving tables, charts, and results. 6500 w. *Philippine Jour of Sci*—May, 1909. No. 7789 N.

See also Steam Calorimeters, under STEAM ENGINEERING; and Analysis, under MINING AND METALLURGY, COAL AND COKE.

Cooling Curves.

On Methods of Obtaining Cooling Curves. G. K. Burgess. Explains methods of thermal analysis, the apparatus used, describing experimental arrangements, the characteristics of cooling curves, etc. 7500 w. *Bul Bureau of Stand*—Nov., 1908. No. 1345 N.

Dynamometers.

A New Transmission Dynamometer. William H. Kenerson. Illustrated description of the design and construction of the instrument and its method of appli-

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cation and use. 1500 w. Jour Am Soc of Mech Engrs—May, 1909. No. 4410 F.

Electric Dynamometers. G. Everett Quick. Illustrates and describes types. 1500 w. Power—Jan. 26, 1909. No. 2091.

Nicolson's Universal Machine-Tool Dynamometer. Illustrated description of apparatus for determining the pressures on the point of the tool. 1500 w. Engng—Feb. 19, 1909. No. 2893 A.

Power Measurements (La Mesure des Puissances). J. Izart. The first part discusses methods of measuring power transmitted by belts, ropes, gearing, etc. Ills. Serial, 1st part. 3500 w. Elec—April 24, 1909. No. 4826 D.

See also Locomotive Dynamometers, under RAILWAY ENGINEERING, MOTIVE POWER, AND EQUIPMENT.

Ergometer.

The Inertia Ergometer of Joseph Doyen and the Resulting Dynamometrical Methods. A. Huberti and J. Doyen. Describes this instrument for measuring the work of the inertia forces, and its use. 5000 w. Bul Int Ry Cong—March, 1909. No. 3955 G.

Friction.

An Apparatus for Studying Friction. Illustrated description of the instrument devised by M. G. Derihon. 1200 w. Sci Am Sup—July 17, 1909. No. 6335.

Gages.

Gages and Interchangeability in Small Scale Manufacture. F. A. Halsey. Illustrates and describes applications of the indicating caliper, explaining its advantages. 1500 w. Am Mach—Vol. 32. No. 23. No. 5384.

The Manufacture of Gages. Discusses the principles of development of a gaging system and the making of plug, and ring gages. Ills. 3500 w. Mach, N Y—Sept., 1909. No. 7502 C.

Limit Gages and Thread Micrometers. Discusses the need and use of limit gages in plain and threaded work and a micrometer for measuring the flats. Ills. 1500 w. Am Mach—Vol. 32, No. 13. No. 3654.

Gages Used in Making Comptometers. Illustrated description of gages for testing accuracy of machine work on levers, rods, cams, gears, etc. 2500 w. Am Mach—Vol. 32. No. 30. No. 6757.

Thomas Gages and Gaging Methods. Illustrates and describes devices used for accurate work on the Thomas car. 2000 w. Am Mach—Vol. 32. No. 21. No. 5013.

MEASUREMENT

Hardness

End-Measuring Gauges (Zur Frage der Endmassnormale). August Bauschlicher. Their uses, types available, etc. Serial, 1st part. 2500 w. Zeitschr f Werkzeug—June 25, 1909. No. 6591 D.

The Johansson Combination Gauges (Les Calibres-Etalons à Combinaisons "Johansson"). A description of the merits of this new system. Ills. 4500 w. Rev de Mécan—June, 1909. No. 6529 E + F.

Limit Gage Bolts (Ueber Grenzlehrbolzen). August Bauschlicher. Describes various types. Ills. 2000 w. Zeitschr f Werkzeug—July 25, 1909. No. 7450 D.

Gas Velocity.

Determination of the Velocity of Gas with the Pitot Tube. O. E. Jager and George C. Westly. Describes the method of determining the velocity of gas in a flue by means of a Pitot tube. 1200 w. Eng & Min Jour—Sept. 4, 1909. No. 7568.

Gear Testing.

See same title, under AUTOMOBILES.

Hardness.

The Analysis of Steel by Mechanical Means. A. F. Shore. Describes methods and the use of the scleroscope, explaining what it measures. 3500 w. Am Mach—Vol. 32. No. 25. No. 5863.

Influence of the Scleroscope in Metallurgy and Manufacturing. A. F. Shore. Illustrated description of the instrument and some of its applications. 3000 w. Mach, N Y—Aug., 1909. No. 6806 C.

Principles of the Scleroscope for Measuring Hardness. Thomas J. Fay. Illustrated description of the Shore scleroscope, explaining its uses. 3500 w. Automobile—March 4, 1909. No. 2966.

Notes on Tests for Hardness. Prof. Thomas Turner. Read before the I. and S. Inst. Compares four typical methods of measuring hardness, showing further research is required before agreement in principle can be reached. 3500 w. Ir & Coal Trds Rev—May 14, 1909. No. 5131 A.

A Metal Dynamograph and Results. W. A. Knight. Illustrated description of an apparatus for determining the hardness of different materials used in machine-shop practice. 2500 w. Am Mach—Vol. 32. No. 34. No. 7344.

Ballentine's Process of Testing the Hardness and Density of Metals. Report of the Franklin Institute on the process devised by William I. Ballentine. 1200 w. Jour Fr Inst—Dec., 1908. No. 969 D.

MECHANICAL ENGINEERING

Hardness

MEASUREMENT

Impact Test

The Hardness of Metals and its Measurement in Cold and Heated Specimens (*La Dureté des Métaux sa Mesure à Chaud et à Froid*). Félix Robin. A review of methods and data of the results of investigation of various metals and alloys. Ills. 8000 w. *Mem Soc Ing Civ de France*—April, 1909. No. 5710 G.

The Hardness of Metals and Its Measurement (*La Durezza dei Metalli e relative Metodi di Prova*). A review and discussion of the various methods of measuring hardness. Ills. 5000 w. *Ing Ferro*—Sept. 1, 1909. No. 8641 D.

The Measurement of Hardness (*Härtebestimmung*). Wolfgang Koch. A description and discussion, with test results, of the Heroult-Shore scleroscope method. Ills. 4000 w. *Zeitschr f Werkzeug*—Sept. 5, 1909. No. 8684 D.

A Simplified Ball-Test Device and the Results Obtained (*Vorrichtung zur vereinfachten Prüfung der Kugeldruckhärte und die damit erzielten Ergebnisse*). A. Martens and E. Heyn. Illustrated description. 3300 w. *Zeitschr d Ver Deutscher Ing*—Oct. 24, 1908. No. 606 D.

The Comparative Method of Making Brinell Hardness Tests (*Essai de Dureté Brinell par Méthode comparative*). L. Grenet. A statement of its advantages, comparing its results with those of the ordinary method. 2000 w. *Rev de Métal*—Dec., 1908. No. 1912 E + F.

A Simplified Ball Hardness Test and Some of Its Results (*Dispositif pour un Essai simplifié de Dureté à la Bille et Résultats obtenus*). A. Martens and E. Heyn. Translated from the *Zeitschrift des Vereines Deutscher Ingenieure* for Oct. 24, 1908. Ills. 4000 w. *Rev de Métal*—Jan., 1909. No. 2620 E + F.

See also Testing Methods, under MEASUREMENT.

Heat Insulation.

The Testing of Heat Insulating Materials (*Le Esperienze sui Materiali coibenti*). Alfredo Bertella. Illustrated description of methods. 4800 w. *Riv Marit*—Dec., 1908. No. 1933 E + F.

Hydraulagraph.

See Shop Practice, under MACHINE WORKS AND FOUNDRIES.

Hydraulic Pressure.

Apparatus for the Measurement of High Hydraulic Pressure (*Apparate zur Messung hoher Flüssigkeitsdrücke*). A. Martens. Describes and discusses various types. Ills. 2200 w. *Zeitschr d Ver Deutscher Ing*—May 8, 1909. No. 5959 D.

Impact.

Some Experiments on Impact. J. E. Sears, Jun. Explains the theory and methods used, and describes experiments to determine the required relationships for stresses. 3000 w. *Engng*—April 30, 1909. Serial. 1st part. No. 4622 A.

Calculation of the Resistance to Shock of Certain Test Pieces (*Calcul du Travail de Choc que peuvent Supporter quelques Epreuves*). L. Grenet. Mathematical discussion of the resistance to shock of bars of various shapes and variously supported. Ills. 2800 w. *Rev de Métal*—July, 1909. No. 7201 E + F.

Impact Test.

The Theory of Impact and Its Application to Testing Materials. Harry D. Tiemann. Reviews some of the relations of dynamics bearing upon this subject and discusses the dynamic stresses, or stresses produced by impact. Mathematical. 5000 w. *Jour Fr Inst*—Oct., 1909. Serial. 1st part. No. 8523 D.

The Resistance of Materials to Impact. T. E. Stanton and L. Bairstow. A report of research work. Ills. 6000 w. *Inst of Mech Engrs*—Nov. 20, 1908. No. 852 N.

Different Methods of Impact Testing on Notched Bars. F. W. Harbord. A report of experiments made to compare results obtained by different methods of impact testing, and to see whether such tests detected any irregularity in steel not revealed in ordinary tests. 5500 w. *Inst of Mech Engrs*—Nov. 20, 1908. No. 853 N.

Comparative Static and Dynamic Tests on Notched Bars (*Vergleichende statische und dynamische Kerbbiegeproben*). A. Leon and P. Ludwik. Results of tests at the Technical High School, Vienna. Ills. 2300 w. *Oest Wochenschr f d Oeffent Baudienst*—Feb. 13, 1909. No. 3399 D.

The Influence of Time and Temperature on Impact Tests (*Influence du Temps et de la Température sur les Essais au Choc*). André Le Chatelier. A review of the author's published results of twenty years of experimentation. 1500 w. *Rev de Métal*—Aug., 1909. No. 7920 E + F.

Recent Impact Tests on Cold Specimens of Ordinary and Special Steels (*Nouveaux Essais de Choc à Chaud sur les Aciers ordinaires et les Aciers spéciaux*). L. Guillet and L. Revillon. Gives results indicating the influence of time and temperature. Ills. 2500 w. *Rev de Métal*—Aug., 1909. No. 7921 E + F.

The Definition of Resilience and Shock Tests (*La Définition de la Résilience et les Essais au Choc*). L. Révillon. Report

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of tests to determine the extent to which shock tests on bars of different sizes are comparable. Tables. 2500 w. *Rev de Métal*—Dec., 1908. 1908 E + F.

Investigation of the Shock Test at Variable Temperatures (*Expériences sur l'Essai au Choc à Température variable*). Léon Guillet and L. Révillon. Gives results of tests to show the variations in results of impact tests at different temperatures. Ills. 3000 w. *Rév de Métal*—Jan., 1909. No. 2618 E + F.

Laboratories.

A Modern Metallurgical Laboratory. A. M. Portevin. Illustrated description of the apparatus used and methods employed in the chemical, mechanical and microscopical departments of the De Dion-Bouton works laboratory in France. 4500 w. *Am Mach*—Vol. 32. No. 3. No. 1864.

Manufacturing Laboratory at Neubabelsberg. Henry Hess. Illustrated detailed description of laboratories for experimental work for plants devoted to the manufacture of fire-arms, cartridges, powder, etc. 1200 w. *Am Mach*—Vol. 32. No. 36. No. 7698.

The Testing Establishment of the Technical College of Berlin. An account of work for the year 1907 is reviewed. 1200 w. *Engr, Lond*—Jan. 22, 1909. No. 2223 A.

The Metal Section of the Testing Laboratory of the Conservatoire National des Arts et Métiers (La Section des Métaux du Laboratoire d'Essais du Conservatoire national des Arts et Métiers). Pierre Breuil. Describes the experimental equipment and outlines the results of the more important researches of recent years. Ills. 23000 w. *Mem Soc Ing de France*—July, 1909. No. 7904 G.

The Testing Laboratory of the Conservatoire National des Arts et Métiers (Conservatoire National des Arts et Métiers, Laboratoire d'Essais). L. Guillet. A brief report of its activities during 1908. 3000 w. *Rev de Métal*—Sept., 1909. No. 8609 E + F.

See also Testing of Laboratories, under MEASUREMENT; and Education, under INDUSTRIAL ECONOMY.

Lubricant Testing.

Oil-Friction Testing Machine. William Alexander. Illustrated description of a machine designed and made in the Wellington Technical School, New Zealand. 1000 w. *Engr, Lond*—Sept. 17, 1909. No. 8132 A.

The Mechanical Testing of Oil (Ueber mechanische Oelprüfung). Dr. H. Hoff-

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Pyrometry

mann. Describes methods used in the laboratory of the Westphalian Mining Company and gives some of the results obtained. Ills. Serial. 1st part. 4500 w. *Glückauf*—Nov. 7, 1908. No. 1151 D.

Metric System.

See Units, under ELECTRICAL ENGINEERING, MEASUREMENT.

Micrometers.

Some Remarkable Printing Office Devices. Snowden B. Redfield. Illustrates and describes ingenious devices so sensitive as to distinguish a variation in thickness of one sheet of paper. 4000 w. *Am Mach*—Vol. 32. No. 26. No. 6093.

The Picard and Colomb Micrometer. Report of the Committee of Economic Arts, of the French Society of Encouragement for National Industry on an instrument intended for easy and rapid measurement of the thickness of objects with parallel sides or the diameter of cylinders. Ills. 1000 w. *Am Mach*—Vol. 32. No. 40. No. 8390.

See also Gages, under MEASUREMENT.

Planimeters.

Principle of Planimeter Operation. M. R. Wells. Explanation of the construction and operation. Ills. 1500 w. *Power*—Sept. 7, 1909. No. 7600.

Principle of Planimeter Operation. M. R. Wells. An explanation showing that the planimeter is a device of simple construction and its principle easy to understand. Ills. 1800 w. *Am Mach*—Vol. 32. No. 42. No. 8805.

Pressure.

See Pressure Indicators, under AUTOMOBILES.

Pyrometry.

Pyrometers for Measurement of High Temperature. Richard P. Brown. Illustrates and describes many types of instruments used industrially. 3500 w. *Pro Engr Club of Phila*—Oct., 1908. No. 4325 D.

The Electrical Pyrometer. Francis H. Davies. Reviews briefly the early methods of temperature measurement, comparing with the accuracy now possible. Describes the three classes of electrical pyrometers. 2000 w. *Elec Engr, Lond*—Sept. 17, 1909. No. 8108 A.

A Practical Note on Thermo-electric Pyrometers. Charles H. Wilson. An article calling attention to a mistake often made by users of thermo-electric pyrometers. 1500 w. *Elec-Chem & Met Ind*—March, 1909. No. 2987 C.

MECHANICAL ENGINEERING

Pyrometry

The Radiation Pyrometer in the Foundry. C. E. Foster. Describes this instrument, explaining its usefulness. 2500 w. *Prac Engr*—Oct. 15, 1909. No. 8873 A.

The Use and Application of Pyrometers in Foundry Work. Charles E. Foster. Considers types and their use. Ills. 3000 w. *Foundry*—May, 1909. No. 4502.

Workshop Pyrometry. Chas. R. Darling. An account of the present condition of pyrometry in relation to its industrial uses. 3000 w. *Mech Wld*—June 18, 1909. Serial, 1st part. No. 6037 A.

The Féry Spiral Pyrometer. Illustrated description. 1200 w. *Engng*—May 14, 1909. No. 4963 A.

The Bristol Recording Pyrometer. Percy Longmuir and T. Swinden. Read before the I. and S. Inst. Reports a test made to ascertain the behavior of the pyrometer under normal works conditions. 2000 w. *Ir & Coal Trds Rev*—May 14, 1909. No. 5136 A.

Temperature Determination and Control for High-Speed Steel Treatment. O. M. Becker. First of two articles reviewing methods and instruments in practical use in industrial processes. Ills. 2500 w. *Engineering Magazine*—May, 1909. No. 4339 B.

Temperature Determination and Control for High-Speed Steel Treatment. O. M. Becker. This second article of a series discusses the principles and uses of pyrometers of the optical and radiation types, and recording apparatus. Ills. 2500 w. *Engineering Magazine*—June, 1909. No. 4986 B.

Pyrometry in the Annealing Room. S. H. Stupakoff. Reviews various high-temperature measuring instruments and their applications, especially the use of pyrometers in annealing malleable iron. 8000 w. *Am Found Assn*—June, 1909. No. 5604 N.

Pyrometry of Beehive Coke Ovens. J. R. Campbell. Varieties of apparatus for measuring high temperatures, with data from the ordinary beehive coke oven in the Connellsville region. 4500 w. *Mines & Min*—Oct., 1909. No. 8256 C.

See also Gas Producers, under COMBUSTION MOTORS; Coke Ovens, under MINING AND METALLURGY, COAL AND COKE; and Pyrometry, under MINING AND METALLURGY, COPPER.

Rubber Testing.

The Testing of Rubber and Other Materials. Information from a communication by Messrs. K. Memmler and A.

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Testing Laboratories

Schob, relating to the chemical and mechanical testing of rubber. The Schopper machine was used for ring sample tests. 900 w. *Engr, Lond*—Oct. 15, 1909. No. 8950 A.

Screw Threads.

A Device for Measuring Screw Threads. M. Eric Anderson. Illustrates and describes roller calipers which can be conveniently adjusted to suit any angle of helix and to measure accurately threads of any lead. 1500 w. *Am Mach*—Vol. 32. No. 41. No. 8802.

Stresses.

Determining Stresses by Thermo-Electric Measurements. Extracts from a paper by E. Rasch, before the Copenhagen Congress of the Int. Assn. for Test. Materials, describing this method. 1000 w. *Eng Rec*—Oct. 9, 1909. No. 8443.

Tachometers.

A New Revolution Recorder and Indicator. F. F. Uehling. Illustrated description of mechanisms designed by the writer. 1200 w. *Stevens Ind*—Jan., 1909. No. 3811 D.

Speed Measuring Instruments and Their Testing (Ueber Geschwindigkeitsmesser und deren Prüfung). A. Wägener. Describes an apparatus for testing speed-measuring instruments in the laboratory. Ills. 3500 w. *Zeitschr d Ver Deutscher Ing*—March 27, 1909. No. 4296 D.

Test Bars.

Perplexing Differences in the Tensile Strength of Round and Square Test Bars. A. Gustersen. Describes the writer's experience, where in every case the square bar showed a much higher tensile strength. 600 w. *Brass Wld*—July, 1909. No. 6478.

A Report on Cast-Iron Test Bars. A. F. Nagle. Gives results of examinations and study of a large number of test-bars. 1700 w. *Jour Am Soc of Mech Engrs*—Mid-Oct., 1909. No. 8750 F.

Influence of Form and Position on Cast Steel Tensile Test Bars. R. A. Bull. A report of tests made of round and rectangular bars, and of a U-shape test bar. 2000 w. *Foundry*—Oct., 1909. No. 8293.

Testing Laboratories.

The Work of the Reichsanstalt in 1907. Information based upon the official report and on publications of special researches. 3000 w. *Engng*—Dec. 18, 1908. Serial 1st part. No. 1371 A.

Materials-Testing and Gas-Engine Laboratories of the Darmstadt Technical High School (Die Materialprüfungsanstalt

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Testing Machines

und das Gasmaschinenlaboratorium der Technischen Hochschule zu Darmstadt). O. Berndt. A brief description of their equipment. Ills. 2500 w. Zeitschr d Ver Deutscher Ing—Nov. 21, 1908. No. 1195 D.

See also Laboratories, under MEASUREMENT.

Testing Machines.

A Ball-Bearing Testing Machine and Its Work. Illustrated description of an effective machine and its working. 2500 w. Am Mach—Vol. 32. No. 9. No. 2937.

300-Ton Universal Testing Machine. Illustrated description of a large machine recently installed in the laboratory of the new university at Birmingham, Eng. 1800 w. Engr, Lond—May 21, 1909. No. 5200 A.

A Laboratory Machine for Applying Bending and Twisting Movements Simultaneously. E. G. Coker. From Pro. of the Phys. Soc., London. Illustrates and describes a machine for applying combined stresses. 2000 w. Engr, Lond—July 9, 1909. No. 6430 A.

A Fatigue Testing Machine. J. H. Smith. Illustrated description of a machine designed by the writer, with explanation of the difficulties overcome. 3500 w. Engng—July 23, 1909. No. 6847 A.

Recent Testing Machines Built by Mohr & Federhaff, Mannheim (Neuere Festigkeitsmaschinen der Mannheimer Maschinenfabrik Mohr & Federhaff). Georg Wazau. Illustrates a number of machines for various purposes. Serial. 1st part. 4500 w. Zeitschr d Ver Deutscher Ing—Sept. 4, 1909. No. 8909 D.

A Mirror Apparatus for the Measurement of Elastic Deformations (Ueber einen Spiegelapparat zur Messung elastischer Längenänderungen). Bernhard Kirsch. Description of the device with discussion of its mathematics. Ills. 2500 w. Oest Wochenschr f d Oeffent Baudienst—Dec. 19, 1908. No. 1978 D.

See also Tool Steels, under MATERIALS OF CONSTRUCTION.

Testing Methods.

Commercial Testing of Iron and Steel. W. F. Burrow. Abstracted from a report to the N. S. W. Government. Describes methods used at the Government testing works at Lithgow, Australia. 3500 w. Ir & Coal Trds Rev—July 30, 1909. Serial, 1st part. No. 6991 A.

The Ball Hardness Test as a Measure of the Strength of Materials (Die Kugeldruckhärte als Mass der Zerreiissfestigkeit). Alfred Kurth. Mathematical. Ills.

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Torsion Meters

2800 w. Zeitschr d Ver Deutscher Ing—Oct. 3, 1908. No. 599 D.

Mechanical Tests of Cast Iron (Essais mécaniques de la Fonte). Ch. Frémont. A review of testing methods, with a description of a new machine and method of testing invented by the author. Ills. 6000 w. Bul Soc d'Encour—May, 1909. No. 6524 G.

Corrosion Tests of Iron and Steel (Essais des Fers et des Aciers par Corrosion). Ch. Frémont. An exhaustive discussion of the value of etching with various chemical reagents in the study and testing of iron and steel. Ills. 7000 w. Rev de Métal—Oct., 1908. No. 511 E + F.

Observation of the Damping of Vibratory Movements as a Test for Metals (Intervention de l'Amortissement dans l'Essais des Fers; Sur l'Essai des Métaux par Amortissement des Mouvements vibratoires). Two papers by A. Guillet and Henry Le Chatelier. 2500 w. Rev de Métal—July, 1909. No. 7203 E + F.

See also Cast Iron, and Steel, under MATERIALS OF CONSTRUCTION; and Laboratories, under MEASUREMENT.

Thermometry.

Modern Methods of Temperature Measurement. Joseph H. Hart. Reviews some of the practical applications of thermometry. 2200 w. Cassier's Mag—June, 1909. No. 5538 B.

Scale and Table, Giving Equivalent Graduations of the Fahrenheit and Centigrade Thermometers. Gives the equivalents without calculation, illustrating the use by examples. 800 w. Power—Feb. 2, 1909. No. 2193.

A Sensitive Thermometer. Prof. S. A. Mitchell. Refers briefly to various thermometers used in research work, and describes in detail the bolometric apparatus which has been brought to a high degree of refinement by Prof. C. G. Abbot. Ills. 2000 w. Sci Am—Feb. 6, 1909. No. 2282.

Some New Measurements with the Gas Thermometer. Arthur L. Day and J. K. Clement. A study, giving detailed description of apparatus used, methods and results. Ills. 15800 w. Am Jour of Sci—Nov., 1908. No. 206 D.

Torsion Meters.

Torsion Meters. Frederick T. Edgecombe. Gives some torsion diagrams of marine engines, and results hitherto unpublished. 1300 w. Engr, Lond—Nov. 27, 1908. No. 868 A.

Measurement of Marine Engine Power by Torsionmeters. Joseph Menmuir. Ab-

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stract of a paper read at meeting of the Greenock Assn. of Engrs. & Shipbldrs. Describes types and their uses. 3000 w. Engr, Lond—Feb. 19, 1909. No. 2901 A.

Torsion Tests.

Torsion Tests (Essais de Torsion). Pierre Breuil. Considers torsion tests as a means of selecting materials, and the relation between torsion and tensile tests. Results of investigations. Ills. 7000 w. Bul du Lab d'Essais—No. 14. No. 1902 N.

Venturi Meters.

Tests on a Venturi Meter for Boiler Feed. Prof. C. M. Allen. Report of tests made to determine the accuracy of a Venturi meter to be used for measuring boiler feed under a great variety of conditions. Ills. 1200 w. Jour Am Soc of Mech Engrs—Mid-Oct., 1909. No. 8751 F.

Water.

Methods of Measuring the Flow of Water. Franklin Van Winkle. Considers tank measurement, tank-orifice method, direct measurement by orifice, and flow through valve. 4000 w. Power—Sept. 7, 1909. No. 7605.

Measuring Flow of Water by Meter and Weir. Franklin Van Winkle. Describes how to make and use a Venturi

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Air Compressors

meter for measuring flow of water in pipes, the construction of weirs and the theory of flow over a weir. 6000 w. Power—Oct. 5, 1909. No. 8318.

The Measurement of Large Quantities of Water (Jaugeages de gros Débits). M.M. Boyer-Guillon, Auclair and Laedlein. Describes the calibration of weirs at the testing laboratories of the Conservatoire National des Arts et Métiers and tests on a centrifugal pump and on two hydraulic turbines. Ills. 20000 w. Bul du Lab d'Essais—No. 15. No. 1903 N.

Measurement of Water by the Moving Screen Method (Wassermenge-Messung mittels Schirmes). Wilhelm Müller. Describes the measurement of water flowing in a conduit by means of a screen entirely filling the section of the conduit and carried by a traveller. Ills. Serial. 1st part. 1500 w. Zeitschr f d Gesamte Turbinenwesen—Sept. 30, 1909. No. 8679 D.

See also Venturi Meters, under MEASUREMENT; and Boiler Waters, under STEAM ENGINEERING.

Weight.

The Merrick Conveyor Weightometer. Detailed description of this appliance for weighing coal or other material while traveling in a continuous stream along the belt of a conveyor. Ills. 2500 w. Engng—Oct. 30, 1908. No. 192 A.

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Air Compression.

Compressed Air Calculation Short Cuts. Gives a chart by which the mean effective pressure and horsepower may be determined without the use of formulæ involving fractional exponents. 1200 w. Am Mach—Vol. 32. No. 42. No. 8807.

Volumes, Pressures and Temperatures in the Adiabatic Compression of Air. Frank Richards. Gives table and chart showing relations of ratios, with explanations. 2500 w. Am Mach—Vol. 32. No. 34. No. 7347.

Mean Effective Pressures in Air Compression or Expansion. Frank Richards. Tables and diagrams offering special facilities for power computations. 1500 w. Am Mach—Vol. 32. No. 41. No. 8801.

A Cheap, Efficient Method of Compressing Air. Jos. H. Hart. Discusses mechanical refrigeration as an aid to air compression for mining purposes. 3500 w. Min Wld—Dec. 4, 1908. No. 845.

Mechanical Refrigeration in Air Compression. Joseph H. Hart. On the superiority of the absorption system in compressing air for the transmission and storage of energy. 4000 w. Power—Oct. 12, 1909. No. 8518.

See also Compressed Air, under POWER AND TRANSMISSION.

Air Compressors.

Compressed Air Production and Use. A. C. Whittome. Read before the transvaal Inst. of Mech. Engrs. Explains an easy and comparatively accurate method of comparing the efficiency of various types of compressors. Discusses reheating, causes of explosions, etc. 3500 w. Ir & Coal Trds Rev—July 23, 1909. No. 6860 A.

Air Compressors. The present article considers briefly the compression of air, and air compressor diagrams. 600 w. Prac Engr—July 23, 1909. Serial, 1st part. No. 6842 A.

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Air Compressors

The Design of Air Compressors. Arthur J. Colville. Discusses the determining of the actual capacity of the machine, and the equal distribution of the power between the cylinders in a two stage machine. 1200 w. *Prac Engr*—Sept. 10, 1909. Serial. 1st part. No. 7851 A.

Operating Steam Driven Air Compressors. C. A. Dawley. Calls attention to points the engineer should understand. 2500 w. *Power*—Nov. 24, 1908. No. 471.

Controlling the Output of the Air Compressor. Frank Richards. Concerning a device for automatically varying the output of an air compressor. Ills. 2000 w. *Eng News*—Nov. 5, 1908. No. 100.

Indicating a Compressor Discharge Pipe. Snowden B. Redfield. Gives some peculiar wave motion diagrams and explains how they can be used to determine the economic performance of an air or gas compressor. 2500 w. *Am Mach*—Vol. 32. No. 37. No. 7771.

Rock Excavation with a Portable Compressor Outfit. Illustrates and describes the portable gasoline-engine compressor recently used for shallow trench work in New York City. 1600 w. *Eng Rec*—Jan. 2, 1909. No. 1427.

Portable Air-Compressors. Illustrates and describes a type built in England. 900 w. *Engng*—June 11, 1909. No. 5658 A.

A Complete Line of German Air Compressors. Newhaus W. Czenaisson. Illustrates and describes types of the Borsig compressors. 2000 w. *Am Mach*—Vol. 31. No. 45. No. 123.

Three Cylinder, Two Stage, Steam Driven Air Compressor. Illustrations and description of one of the largest enclosed type machines ever built. 1800 w. *Ir Trd Rev*—July 1, 1909. No. 6110.

Two-Stage Air Compression. George L. Fales. Illustrated account of the conversion of a single-stage compressor into a two-stage machine. 1000 w. *Power*—Aug. 31, 1909. No. 7409.

Air Compressor for South Africa. Illustrates and describes one of the largest enclosed-type air-compressing plants ever made. 1500 w. *Engr, Lond*—May 21, 1909. No. 5199 A.

The Compressed Air Plant for the Rondout Siphon. Illustrated description of the power plant for work on this portion of the Catskill Aqueduct. 2000 w. *Eng Rec*—April 10, 1909. No. 3861.

Compressed Air for Mining in Cobalt District. Alex. Gray. Information concerning the Taylor hydraulic air com-

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pressor system. Ills. 2500 w. *Min Wld*—Dec. 12, 1908. No. 1032.

The Plant and Equipment of the Cobalt Hydraulic Company. Illustrated description of the Taylor air-compressor plant at Ragged Chutes, on the Montreal River. 800 w. *Can Min Jour*—Oct. 15, 1909. No. 8796.

Notable Performances of Air Compressors (Bemerkungswerte Ausführungen von Luftkompressoren). Hans Wunderlich. Describes machines by various European makers and gives indicator cards. Ills. 3800 w. *Zeitschr d Ver Deutscher Ing*—Oct. 31, 1908. No. 607 D.

Centrifugal Compressors (Ueber Turbogebälde). C. Regenbogen. Discusses their design, operation, efficiency, etc. Ills. 6300 w. *Stahl u Eisen*—Nov. 25, 1908. No. 1147 D.

Hoerbiger-Rogler Compressors and Blowers. Illustrated description of an electrically-driven air-compressor, and a blowing engine equipped with these valves. 800 w. *Engng*—May 7, 1909. No. 4726 A.

Electrically Driven Air Compressors (Elektrisch angetriebene Kompressoren). J. Havlicek. A theoretical discussion of their operation, governing, etc. Ills. 5000 w. *Zeitschr d Ver Deutscher Ing*—April 10, 1909. No. 5071 D.

See also Electric Pumping, under HYDRAULIC MACHINERY; and Machinery, under MINING AND METALLURGY, MINING.

Belt Driving.

Leather Belting Compared to Rope Drives. Harrington Emerson. Read before the Leather Belting Mfrs. Assn. A comparison of claims made, and discussion of rope and belt transmission. 3500 w. *Power*—Dec. 1, 1908. No. 724.

Leather Belting Compared to Rope Drives. John H. Damon. A critical review of paper on this subject by Harrington Emerson. 3500 w. *Power*—Dec. 22, 1908. No. 1083.

Belting Compared with Chain Transmission. Harrington Emerson. Paper read before the Leather Belting Mfrs. Assn. Some statements in regard to the service of chains and belts. 1200 w. *Power*—April 6, 1909. No. 3769.

Belt, Motor and Rope Drive. H. D. Jackson. Criticizes statements made by Harrington Emerson, and examines costs of operating and installing, and some of the troubles with the belt drive. 2200 w. *Power*—Oct. 12, 1909. No. 8515.

The Transmission of Power by Leather Belting. Carl G. Barth. Conclusions

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Electric Driving

based principally on the experiments of Lewis and Bancroft. Gives diagrams and explanations of their use. Ills. 8000 w. Jour Am Soc of Mech Engrs—Jan., 1909. No. 1850 F.

The Transmission of Power by Leather Belting. Discussion of Carl G. Barth's paper. 16000 w. Jour Am. Soc of Mech Engrs—March, 1909. No. 3467 F.

Steel Bands for Power Transmission. J. P. Schroeter. Describes some German experiments, showing favorable results. 600 w. Eng News—Oct. 14, 1909. No. 8565.

Belt or Positive Chain Drive for Machine Tools (Riemenantrieb oder positiver Kettenantrieb für Werkzeugmaschinen). A. Bauschlicher. A comparison of the systems. Ills. Serial, 1st part. 2000 w. Zeitschr f Werkzeug—Dec. 15, 1908. No. 1982 D.

The Efficiency of Power Transmission by Belting (A propos du Rendement des Courroies de Transmission). Karl Kobes. Mathematical. Ills. 5500 w. Rev de Mécan—June, 1909. No. 6527 E + F.

Belt Driving and Gehrckens' Theory (Das Riemengetriebe und die Gehrckenssche Theorie). Ludwig Benjamin. A theoretical consideration of belt driving problems. Ills. 7500 w. Zeitschr d Ver Deutscher Ing—April 24, 1909. No. 5078 D.

Practical Charts for Dimensioning Pulleys for Belt and Rope Driving (Praktische Arbeitstabellen zur Bestimmung der Dimensionen bei Riemenscheiben und Seilscheiben). H. Vetter. Gives a number of charts with explanation of their use. Ills. 1500 w. Giesserei-Zeit—Sept. 1, 1909. No. 8658 D.

See also Pulleys, under POWER AND TRANSMISSION.

Belting.

Leather Belting. Information helpful in the selection of good belting. Ills. 1500 w. Am Engr & R R Jour—May, 1909. No. 4423 C.

German Steel Belts for Transmitting Power. H. Prime Kieffer. Illustrated description of the Eloesser steel belt, especially the method of locking the ends of the belt. 1400 w. Ir Age—May 20, 1909. No. 4768.

Power Transmission by Endless Belts. W. Worby Beaumont. Discusses the efficiency of belts and the importance of high frictional adhesion. 1700 w. Elec Rev, Lond—Oct. 30, 1908. No. 183 A.

Chain Driving.

See Belt Driving, under POWER AND TRANSMISSION.

Compressed Air.

Advantages and Disadvantages of Compressed Air Power Transmission on Contract Work as Compared with Steam. Extracts from an article by Frank Richards in "Barge Canal Bulletin" for July, 1909. Claims a saving in cost and explains numerous advantages. 2500 w. Engng-Con—Aug. 11, 1909. No. 7006.

Air Receiver Practice. Frank Richards. Discusses the desirability of having dry compressed air, and the efforts of recent practice to obtain it. Ills. 2000 w. Power—Aug. 24, 1909. No. 7337.

Researches on the Escape of Compressed Air from Small Tubes and the Eddy Currents Set Up (Untersuchungen über den Ausfluss komprimierter Luft aus Kapillaren und die dabei auftretenden Turbulenzerscheinungen). Dr. Ruckes. Reports researches similar to those of Osborne Reynolds on water. Ills. 2500 w. Zeitschr d Ver Deutscher Ing—Dec. 26, 1908. No. 2107 D.

See also Air Meters, under MEASUREMENT; and Air Compression, under POWER AND TRANSMISSION.

Costs.

Notes on the Cost of Power. H. G. Stott. Compiled with the aim of showing the fundamental relations between the various items that make up the cost. 700 w. Diagrams. Pro Am Inst of Elec Engrs—April, 1909. No. 3959 F.

Costs of a Gas Engine and of a Combined Steam Plant. T. M. Chance. Considers the cost of operating and maintaining, under like conditions, a 1000-kw plant of each type, comparing the economy. 3000 w. Eng Rec—Sept. 4, 1909. No. 7559.

The Cost of a Kilowatt-Hour. R. A. Day. A chart showing the items which enter into the cost of a kw.-hour of electrical energy, with explanatory notes. 2000 w. Elec Wld—Oct. 7, 1909. No. 8400.

Reducing the Cost of Power in Works and Factories. Joseph A. Jeckell. Read before the Birmingham (Eng.) and District Elec. Club. Calls attention to wasteful methods of making and using power 3000 w. Elec Engr, Lond—March 26, 1909. No. 3775 A.

See also same title, under ELECTRICAL ENGINEERING, GENERATING STATIONS.

Electric Driving.

Industrial Engineering. H. W. Peck. Describes methods of solving the present day problems of power, giving method of determining the motor equipment re-

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Electric Driving

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quired, etc. Ills. 3000 w. Elec Jour—Feb., 1909. No. 2737.

The Economy of the Individual Motor Drive for Machine Tools. Howard S. Knowlton. An illustrated article favoring individual rather than group driving and stating its advantages. 3500 w. Engineering Magazine—Dec., 1908. No. 670 B.

Increasing the Efficiency of the Electric-Motor Drive. Howard S. Knowlton. A review of a large series of tests of electric driving. 3000 w. Engineering Magazine—Oct., 1909. No. 8172 B.

Individual Motor Drive. W. B. Komvenhoven. Some of the advantages of the individual drive are stated and types of motors discussed. 2500 w. Ry & Loc Engrg—Dec., 1908. No. 795 C.

Electric Driving of Machine Tools. A. G. Seaman. Abstract of a paper read before the Coventry Engrg. Soc. The advantages, efficiency, etc., are discussed. 1500 w. Elect'n, Lond—Dec. 11, 1908. No. 1212 A.

The Application of Electric Motors to Industrial Service. E. B. Parsons. Read at Westinghouse Motor Dealers' Convention. Considers the development and progress, and the field for direct- and alternating-current motors. 2500 w. Elec Engr, Lond—Aug. 13, 1909. No. 27199 A.

The Advantage of Group or Individual Drive in Certain Installations. C. A. Graves. Aims to show why group or individual drive is preferable, giving examples. 3800 w. Elec Age—Sept., 1909. No. 7841.

Points to Consider in Choosing a Motor. H. M. Phillips and E. F. Butler. Views of two experienced engineers upon features of construction, speeds, windings, and ratings of direct-current motors. 4500 w. Power—Oct. 26, 1909. No. 8775.

Electric Motors for Industrial Plants. W. E. Crane. Describes motor installation to meet stated conditions, and discusses questions related. 1500 w. Power—Oct. 12, 1909. No. 8519.

The Installation of Electrical Power Plant. J. T. Corner. Deals with the general features and the various types of motors suited to each special kind of machinery, and the gearing of the motor to the machine. 1800 w. Mech Wld—Sept. 24, 1909. No. 8355 A.

Installation, Operation, Care and Repair of Electric Motors in Industrial Operations. C. E. Daniels. Illustrated article giving information of value. 2500 w. Elec Rev, N Y—Oct. 23, 1909. Serial. 1st part. No. 8783.

Electricity in Building Operations. Describes the application of the electric drive to machinery used by builders and contractors. Ills. 2000 w. Elect'n, Lond—Oct. 1, 1909. Serial. 1st part. No. 8485 A.

The Depreciation of Electric Plant. J. T. Corner. Aims to show how rapid deterioration may be prevented. 1500 w. Mech Wld—Oct. 15, 1909. No. 8888 A.

The Application of Motors to Machine Tools. Dexter S. Kimball. Discusses how far the individual drive may be carried with advantage, group driving and matters relating to it, speed control, etc. 4500 w. Mech Engr—Nov. 27, 1908. No. 858 A.

Characteristics of Motors for Large Shears. Brent Wiley. Outlines the conditions which the motor speed characteristics should meet, showing the importance of properly choosing so that the fly-wheel may do the cutting work. 3000 w. Pro Am Inst of Elec Engrs—Jan., 1908. No. 1365 F.

Emergency Connections for Electric Motors. C. V. Hull. Describes departures from conventional methods, used in emergencies. 1200 w. Power—April 27, 1909. No. 4312.

Mechanical Considerations in the Application of Electric Motors to Industrial Machinery. C. B. Mills. Discusses belt, rope, and chain connections. 2000 w. Elec Jour—May, 1909. No. 4546.

The Industrial Application of the Electric Motor, as Illustrated in the Gary Plant of the Indiana Steel Company. B. R. Shover. Illustrated detailed description of the plant and the applications of electric power. 9000 w. Pro Am Inst of Elec Engrs—March, 1909. No. 3477 F.

Discussion on "The Industrial Application of the Electric Motor," New York, March 12, 1909. Discussion on B. R. Shover's paper. 5800 w. Pro Am Inst of Elec Engrs—May, 1909. No. 4996 F.

Electric Motors in Steel Mills. Comments of electrical engineers on the unusual problems worked out at Gary, Ind. 4000 w. Ir Age—May 20, 1909. No. 4765.

Electric-Driven Rolling Mills. E. Friedlander. General discussion of the advantages and of details of installations. Also short paper by E. W. Yearsley, on Rolling Mill Motors. 3000 w. Pro Am Inst of Elec Engrs—July, 1909. No. 6487 F.

Electric Control for Rolling-Mill Motors. C. T. Henderson. An illustrated review of the development of controlling apparatus for applications of electricity in the steel industry. 2500 w. Pro Am Inst of Elec Engrs—Sept., 1909. No. 8178 F.

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The Electrification of Steam-Driven Non-Reversing Rolling Mills. W. F. Mylan. Read before the Leeds Sec. of the Inst. of Elec. Engrs. Considers important features to bear in mind, giving particulars of actual installations. 6000 w. Elec Engr, Lond—May 7, 1909. No. 4714 A.

Electric Drive for Rolling Mills (Ueber elektrische Walzenstrassenantriebe). V. Graubner. A discussion of its economy. Ills. Serial, 1st part. 3200 w. Elektrotech u Maschinenbau—April 25, 1909. No. 5069 D.

Speed Regulation of Machine Tools at the Fore River Shipyard. Illustrated article describing the interesting system for speed variations, the H. Ward Leonard multi-stage system of the Allis-Chalmers Co. 2500 w. Eng Rec—Jan. 2, 1909. No. 1425.

Electric Driving for Weaving Machinery. Albert Walton. Illustrates and describes applications of individual electric motors to the direct operation of looms. 3000 w. Cassier's Mag—July, 1909. No. 6346 B.

The Electrical Operation of Textile Factories. Herbert W. Wilson. Reviews recent developments in this application of electricity, showing some of the points requiring attention. 2500 w. Inst of Mech Engrs—July, 1909. No. 6973 N.

Electric Driving in the Textile Industries (La Commande électrique des Métiers en Filature). D. de Prat. Reviews the advantages of the electric drive and the extent of its use in the textile industries. Ills. 2500 w. Génie Civil—April 3, 1909. No. 4835 D.

Electrically Driven Woodworking Machinery. James F. Hobart. A summary of shop power conditions and their treatment. 2500 w. Wood Craft—Jan., 1909. No. 1490.

Power Used in the Re-manufacture of Lumber, with Special Reference to Central-Station Energy for That Purpose. C. H. Scittot. Abstract of a paper before the Mich. Elec. Assn. Considers the methods and requirements of power for woodworking tools, and the importance of recording essential data. 3000 w. Elec Rev, N Y—Sept. 4, 1909. Serial. 1st part. No. 7589.

An Electrically Driven Paper Mill. Describes the plant for a mill on the banks of the Tyne, England. 2500 w. Engr, Lond—June 11, 1909. No. 5638 A.

Electric Driving in a Paper Mill. Discusses the economy of electric driving in paper mills where steam is largely produced for heating and boiling and describes an English plant so equipped.

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Ills. 950 w. Elec Rev, Lond—May 28, 1909. No. 5417 A.

Slow-Speed Drive of Single-Motor Web Presses. S. H. Sharpsteen. Discusses methods of control. Ills. 2500 w. Elec Rev., N Y—April 17, 1909. No. 3996.

Electric Motors in a Brewery. William Keily. Illustrates and describes applications of electric power in the plant of the Pabst Brewing Co., Milwaukee, Wis. 1500 w. Elec Wld—Feb. 4, 1909. No. 2268.

Electric Main Drives in German Mills. Eugene Eichel. Discusses the development of electric driving in Germany. The first part illustrates and describes the generators used. 5500 w. Ir Trd Rev—March 4, 1909. Serial. 1st part. No. 2961.

Electricity in an Indian Railway Workshop. Illustrated description of an installation at Lahore (Punjab). 3000 w. Elec Rev, Lond—Jan. 29, 1909. No. 2345 A.

See also A. C. Motors, and Controllers, under ELECTRICAL ENGINEERING, DYNAMOS AND MOTORS; and Rolling Mills, under MINING AND METALLURGY, IRON AND STEEL.

Electric Power.

Electricity and Its Application to the Reduction of Waste. A. B. Gridley. Deals with the various ways in which electricity saves "waste." Also the question of price. 3500 w. Elect'n, Lond—Jan. 22, 1909. No. 2206 A.

Electricity and Its Application to the Reduction of Waste. Arnold B. Gridley. Abstract of paper read before the Cleveland Inst. of Engrs. Considers its application to the reduction of waste of capital expenditure, labor, coal, oil, water, space, etc. 3500 w. Engng—March 5, 1909. No. 3174 A.

Electrical Accidents in Workshops. Information from report of G. Scott Ram, bearing upon the peculiar risks and dangers due to using electric power. 5500 w. Mech Engr—June 11, 1909. No. 5640 A.

See also Industrial Plants, under ELECTRICAL ENGINEERING, DISTRIBUTION.

Gas Compressors.

Test of Gas Compressor No. 3 of the New Orleans Gas Light Company, Saturday, January 9, 1909. W. B. Gregory. Illustration with report of test and results. 3000 w. Jour Assn of Engng Socs—July, 1909. No. 7810 C.

Theory and Construction of Compressor Valves. M. Hirsch. Discusses the causes of loss in operation of gas compression machines and isolated subjects.

MECHANICAL ENGINEERING

Gas Power

Diagrams. 1200 w. Ice & Refrig—Oct., 1909. No. 8314 C.

High Pressure Gas Transmission. Describes steam driven compressor for high pressure gas transmission in country towns. Ills. 800 w. Can Engr—June 4, 1909. No. 5391.

Gas Power.

The Gas Power Plant as a Means of Fuel Conservation. Dr. Charles E. Lucke. A review of the fundamental principles on which its substitution for steam depends. 2000 w. Engineering Magazine—April, 1909. No. 3529 B.

The Value of Gas Power. Charles E. Lucke. Brief discussion of the conditions that fix the best field for the gas power plant, giving information of cost, fixed charges, etc. 5500 w. Pro Soc of Ap Sci—Session 1908-1909. No. 4096 C.

The Value of Gas Power. Charles E. Lucke. An illustrated article giving information on characteristics of the gas power installations, cost, etc. 5500 w. Sch of Mines Qr—April, 1909. No. 5898 D.

Suction Gas Producer Power for Factories. L. P. Tolman. Claims that it saves from 1-2 to 3-4 of the coal required for steam power. Ills. 2000 w. Am Mach—Vol. 31. No. 45. No. 125.

Some Effects of Gas Power on Tendencies and Development of the National Industry in Germany. Dr. F. E. Junge. A discussion of the effect of electrical energy on the iron and steel industry, and the economy of gas power. 3500 w. Ir Trd Rev—Feb. 25, 1909. No. 2768.

See also Blast-Furnace Gas, under MINING AND METALLURGY, COPPER.

Gas vs. Steam.

Graphical Comparison of Steam and Gas Engines as Power Producers. Harold Whiting Slauson. A comparison of the relative efficiencies, fuel consumption and cost. 900 w. Ir Age—March 11, 1909. No. 3076.

Gearing.

Power Transmission by Toothed Wheels (Sulle Trasmissioni per Ruote dentate). Ottorino Pomini. Begins a complete discussion of power transmission by gearing, with a consideration of the design of gear wheels. Serial, 1st part. 3300 w. Industria—July 18, 1909. No. 7242 D.

See also Gears, and Journal Loads, under MACHINE ELEMENTS AND DESIGN.

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Gears.

The Lecoche Frictionless Transmission Gear. Illustrated description of this interesting new invention. 800 w. Engng—July 2, 1909. No. 6306 A.

Hydraulic Transmissions.

A New Form of Hydraulic Gear for the Transmission of Power. Illustrates and describes an invention recently patented by H. S. Hele-Shaw. 1200 w. Prac Engr—July 9, 1909. No. 6414 A.

Lubricants.

Filtering Oil for Repeated Use. John M. Howland. Illustrated description of the Turner filter and its operation. 800 w. Power—Nov. 10, 1908. No. 164.

The Selection of an Oil for Lubrication. Henry M. Wells and William Scott-Taggart. Gives reasons why physical tests are useless. 3000 w. Power—July 27, 1909. Serial, 1st part. No. 6697.

See also Lubricant Testing, under MEASUREMENT; and Engine Lubrication, under STEAM ENGINEERING.

Lubrication.

The Lubrication of Bearings. A. L. Campbell. Briefly considers classes of lubricants, their quality, and the manner of applying to bearings. Ills. 3000 w. Engineering Magazine—Dec., 1908. No. 678 B.

The Selection of an Oil for Lubrication. Henry M. Wells and William Scott-Taggart. Notes on the use of oil testers, emulsification, and evaporation of oils. deposits, etc. 3500 w. Power—Aug. 3, 1909. No. 6821.

Some Experiments on Lubrication. W. F. Pullen and W. T. Finley. Describes experiments undertaken to determine how far some of the mechanical properties of a lubricant might influence its selection for a particular purpose. 2000 w. Mech Engr—Oct. 15, 1909. Serial, 1st part. No. 8884 A.

Some Tests of Grease Lubrication. A report of tests made at Cornell University to determine the ability to endure extreme bearing pressure. 1400 w. Am Mach—Vol. 32. No. 40. No. 8388.

The Brady Controllable Level Apparatus for Distributing Liquids. Diagrams and description of this lubricator, and some of its uses. 1200 w. Ir & Coal Trds Rev—Feb. 12, 1909. No. 2598 A.

See also same title, under AUTOMOBILES.

Mechanical Plants.

Mechanical Power in Country Houses. Illustrated description of an installation near Godalming, giving water supply and

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Mechanical Plants

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Power Plants

electrical equipment. 2200 w. Engng—Dec. 11, 1908. No. 1214 A.

The Mountain Residence, at Arden, N. Y., of Mr. E. H. Harriman. Lucy Cleveland. Describes especially the plant for heating, lighting and water supply, of this fine 69-room residence, with its 13 halls and 30 bath-rooms. Ills. 4500 w. Dom Engng—Aug. 21, 1909. No. 7188.

Electricity in the Arden Residence of the Late E. H. Harriman. Brief illustrated description of electrical service for lighting, heating, cooking, motor applications, telephone systems and call-bells. 2500 w. Elec Rev, N Y—Sept. 18, 1909. No. 7837.

City Investing Building's Power Plant. Thomas Wilson. Illustrated description of a modern plant for a 33-story building having many features of interest. 3500 w. Power—Dec. 15, 1908. No. 1041.

A Combination Ventilating, Heating and Cooling Plant in a Bank Building. A. M. Feldman. Gives data and results of a plant installed in a bank building in New York City. Ills. 3500 w. Am Soc of Heat & Vent Engrs—July 15, 1909. No. 6466 N.

Heating and Ventilating the National City Bank, New York. Illustrates and describes the mechanical equipment of this building. 1500 w. Heat & Vent Mag—June, 1909. No. 5554.

The Heating, Sanitary and Power Equipment of a Large Office Building. E. B. Lennig. Illustrated description of the systems installed in the eighteen-story Humboldt Savings Bank, San Francisco. 1000 w. Dom Engng—Dec. 5, 1908. No. 872.

Mechanical Plant of the Keyser Building, Baltimore. Plan and description of unusual features to meet conditions. 2000 w. Eng Rec—May 22, 1909. No. 4926.

Rehabilitating Mechanical Equipment of a New York Hotel. George T. Mott. Illustrated description of the modernized plant recently installed in the Albermarle Hotel. 2000 w. Met Work—Aug. 28, 1909. No. 7404.

The Electrical and Mechanical Installation in the Hotel La Salle. Howard Ehrlich. Illustrated description of the very complete equipment of Chicago's newest and largest hotel. 3000 w. Elec Rev, N Y—Sept. 4, 1909. No. 7590.

The Mechanical Plant of the Hotel Denechaud, New Orleans. Howard S. Knowlton. Plan and detailed description of a plant for supplying electric light, power, refrigeration, hot and cold water

and steam-heating service. 2000 w. Eng Rec—Aug. 28, 1909. No. 7385.

Power Plant and Heating System at U. S. Naval Hospital, New Fort Lyon, Col. A. P. Ball. Brief illustrated description of a plant for a group of buildings. 1200 w. Elec Wld—Dec. 19, 1908. No. 1268.

Power Plant of St. Luke's Hospital, Chicago. Osborn Monnett. Illustrates and describes a plant containing special heating and ventilating features. 2500 w. Power—Dec. 15, 1908. No. 1044.

The Mechanical Plant of the Harvard Medical School. Howard S. Knowlton. Plans and detailed description of a plant for the dual work of instruction and research. It serves a group of buildings. 4000 w. Eng Rec—July 31, 1909. Serial, 1st part. No. 6797.

Design of a New Heating and Power Plant for the University of Minnesota. Presents the general layout of machines and apparatus for a plant to heat a group of buildings. 2000 w. Minn Engr—Nov., 1908. No. 1361 C.

New Power Plant of Carnegie Institute. Thomas Wilson. Illustrated detailed description of a mechanical plant for an immense building. 7500 w. Power—Jan. 12, 1909. No. 1660.

The Cleveland Technical High School. H. W. Woodward. Illustrated description of the heating, lighting, power and ventilating systems in this \$400,000 building. 3000 w. Power—June 1, 1909. No. 5172.

Power Plants.

The Design of Steam-Electric Power Plants. Frank Koester. Discusses the location, general arrangement, building, and boilers in the present number. Ills. 2500 w. Elec Rev, N Y—March 13, 1909. Serial. 1st part. No. 3130.

The Shop Power Plant. Charles L. Hubbard. Gives suggestions to guide in the selection of equipment. Ills. 5000 w. Ir Age—July 15, 1909. No. 6340.

Increasing the Efficiency of Factory Power Houses. R. A. Smart. Considers points affecting the general efficiency and economy of the plant. Ills. 7000 w. Elec Jour—April, 1909. No. 3950.

Comparative Efficiencies of Power Plants, With Special Reference to the Efficiency of a Superheated Steam Pipeline. Frank R. Brownlee. An account of investigations made. 5000 w. Wis Engr—June, 1909. No. 5691 D.

The Small Economics of a Power Plant. A. S. Atkinson. Urges the adoption of

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Power Plants

more scientific methods in a plant supplied with the ordinary reciprocating engines and their auxiliaries. 2200 w. *Boiler-Maker*—Jan., 1909. No. 1666.

Power Plant Waste. Percival R. Moses. Calls attention to losses easily prevented. 5000 w. *Cassier's Mag*—Oct., 1909. Serial. 1st part. No. 8462 B.

The Reorganization of Factory Power Plants. Describes points of importance in such work. 1500 w. *Mech Wld*—Dec. 18, 1908. Serial. 1st part. No. 1388 A.

Reducing the Cost of Power in Works and Factories. Joseph A. Jeckell. Read before the Birmingham and District Elec. Club, England. Brief consideration of power waste, and the possible economies. 2500 w. *Ir & Coal Trd Rev*—March 19, 1909. No. 3631 A.

Combined Lighting and Heating Plants for Modern Commercial Buildings (Die kombinierte Beleuchtung und Heizung moderner Geschäftsgebäude). Carl Fred. Holmboc. Discusses their design and first and operating costs. Ills. 2000 w. *Elektrotech u Maschinenbau*—March 14, 1909. No. 4287 D.

Power Plant of the New Plaza Hotel, New York. Plans and detailed description of a mechanical equipment of unusual size. 5000 w. *Eng Rec*—Nov. 21, 1908. No. 412.

Mechanical Equipment of the Plaza Hotel. Warren O. Rogers. Illustrated description of the power plant of New York's finest hotel. 3000 w. *Power*—May 18, 1909. No. 4738.

Power Plant of the Aphorip Apartment, New York. Plan and description of a plant for a 12-story, steel-cage building, which possesses special features of interest. 3500 w. *Eng Rec*—July 17, 1909. No. 6398.

Power Generation in School Buildings. Charles L. Hubbard. Illustrates and describes the power plant of the Newton Technical High School building, Newton, Mass. 3000 w. *Ind Engng*—Sept. 15, 1909. No. 8047 C.

Power Plant of the Cleveland Arcade. H. W. Woodward. Illustrates and describes the method of solving a difficult problem in power plant design. 3500 w. *Ind Engng*—May, 1909. No. 4785 C.

Power Equipment of the New Hecker Flour Mills, New York City. Briefly describes this recently completed mill on the East River, the largest on the Atlantic Coast. Describes the solution of interesting driving problems. Ills. 3500 w. *Eng Rec*—March 27, 1909. No. 3542.

Power Plant of West Point Military Academy. Illustrated detailed description

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Power-Plant Testing

of the plant for lighting, heating and power purposes. 6000 w. *Power*—April 27, 1909. No. 4309.

Power Plants, American La France Fire Engine Company. Detailed description of a plant in Elmira, N. Y., supplying a group of buildings. Plan. 3000 w. *Eng Rec*—Oct. 9, 1909. No. 8444.

The New Keystone Watch Case Co. Plant. F. L. Johnson. Illustrated account of how an old plant was remodeled without interrupting the service. 2500 w. *Power*—June 15, 1909. No. 5492.

Power Equipment of the Bellman Brook Bleachery. Describes a model plant for the bleaching of fine cotton goods at Fairview, N. J. Ills. 3500 w. *Eng Rec*—June 5, 1909. No. 5284.

The Power Plant of the University of Alabama. F. H. Sibley. Illustrated description of plant furnishing light, heat and power. 1500 w. *Elec Wld*—July 22, 1909. No. 6614.

New Power Plant at Williamsport, Penn. Illustrated description of a modern plant having novel layout of steam and feed-water piping, and interesting coal-handling apparatus and condenser arrangement. 1500 w. *Power*—Aug. 10, 1909. No. 6992.

The Power Plant of the A. E. G. Turbine Works at Berlin (Das Kraftwerk der A. E. G-Turbinenfabrik in Berlin). O. Lasche. Illustrated description of a plant in which the prime movers are turbines undergoing tests before delivery to purchasers. Serial, 1st part. 2800 w. *Zeitschr d Ver Deutscher Ing*—April 24, 1909. No. 5077 D.

See also **Coal Bunkers**, under **CIVIL ENGINEERING, CONSTRUCTION**; **Gas Power Plants**, under **COMBUSTION MOTORS**; and **Isolated Plants**, under **ELECTRICAL ENGINEERING, GENERATING STATIONS**.

Power-Plant Testing.

Trials of a Steam-Turbine Plant. A report of trials of a steam plant at Greenvale Mill, near Manchester, Eng. The mill is electrically driven and the motors are supplied with current from a 500-kw. Brush-Parsons turbo-alternator. Ills. 5000 w. *Engng*—Feb. 26, 1909. No. 3071 A.

Continuous Testing of Steam Plants. James E. Lea. Abstract of paper before the Manchester Assn. of Engrs. On the value of such testing and its relation to efficiency and economy. 4500 w. *Mech Engr*—March 19, 1909. No. 3609 A.

MECHANICAL ENGINEERING

Pulleys

Pulleys.

Pulley Data: Ratio of Diameters, Distance Between Centers and Arc of Contact. F. C. Helms. Gives curves for calculating the various dimensions, with explanation. 600 w. *Elec Wld*—Jan. 7, 1909. No. 1669.

The Crowning of Pulleys. J. Stormouth. The reason for crowning is explained and the usual practice discussed. 2000 w. *Mech Wld*—Jan. 15, 1909. No. 2056 A.

Rope Driving.

Rope Driving. Snowden B. Redfield. Considers method of determining the size of rope and other matters relating to rope-driving. 1500 w. *Power*—Dec. 8, 1908. No. 875.

The Transmission of Power by Ropes. Edwin Kenyon. Abstract of paper read before the S. Wales Inst. of Engrs. An examination of the practical details upon which the success of rope-driving depends, giving a table of h.p. for different sizes. Ills. 6000 w. *Engng*—March 12, 1909. Serial. 1st part. No. 3422 A.

The Gearing of Modern Cotton Spinning Mills. The remarks usually apply to either the Blackburn or Oldham district, but are of universal application. Rope-driving only is discussed. 1000 w. *Mech Wld*—Oct. 1, 1909. Serial. 1st part. No. 8476 A.

Rope-Driving at Rolling Mills and Collieries. Descriptions and illustrations from paper before the S. Wales Inst. of Engrs. 1500 w. *Ir & Coal Trds Rev*—March 5, 1909. No. 3180 A.

The Design of Chain and Rope Transmission Systems for Maximum Life (*Comment construire les Transmissions par Câbles ou par Chaines pour réaliser le Maximum de Durée des Organes tracteurs*). Ernst Heckel. Translated from *Stahl und Eisen*. Ills. 4000 w. *All Indus*—June, 1909. No. 6542 D.

See also Belt Driving, under POWER AND TRANSMISSION.

Shaft Bearings.

Line Shaft Bearings. Hugo Presser. Shows the importance of uniformity in their supports. Ills. 2500 w. *Ind Engng*—Sept. 15, 1909. No. 8050 C.

Shafting.

The Alinement of New and Realignment of Old Shafting. James Lomas. An explanation of methods, illustrating devices. 1800 w. *Am Mach*—Vol. 32. No. 2. No. 1751.

The Alinement of New and Realignment of Old Shafting. James Lomas.

POWER AND TRANSMISSION

Turbo-Compressors

Directions for the erection and alining of shafting. Ills. 1800 w. *Power*—Feb. 2, 1909. No. 2192.

Methods of Attaching Shafting in Reinforced Concrete Buildings. William M. Bailey. Read before the Nat. Assn. of Cement Users. Illustrated description of different systems used. 1500 w. *Eng Rec*—March 13, 1909. No. 3108.

Hanging Wires and Shafting in a Concrete Factory. Methods used in concrete factory buildings at Hoboken, N. J., as described by Morris W. Lee in *The Armour Engr*. 2500 w. *Eng Rec*—April 24, 1909. No. 4172.

Methods of Attaching Shafting, Piping, Etc., to Reinforced Concrete Buildings. Gives sketches of a variety of forms of hangers for both shafting and piping, with description. 1000 w. *Engng-Con*—Sept. 29, 1909. No. 8229.

Solar Energy.

Power from the Sun's Heat. Illustrates and describes what has been accomplished by Frank Shunan at Philadelphia. 3500 w. *Eng News*—May 13, 1909. No. 4644.

Experiments in the Development of Power from the Sun's Heat. H. E. Willise. An outline of work in the effort to make sun power commercially possible. Also editorial. Ills. 6500 w. *Eng News*—May 13, 1909. No. 4645.

Tidal Power.

Tidal Power. W. C. Horsnail. The present article describes some early tide wheel arrangements, and gives a study of the principles involved. Ills. 2000 w. *Engr, Lond*—Feb. 26, 1909. Serial. 1st part. No. 3073 A.

Turbo-Compressors.

Turbo - Blowers. C. Regenbogen. Trans. from *Stahl und Eisen*. Reviews progress in Germany with turbine driven rotary air compressors for blast furnace service. Ills. 4500 w. *Ir Age*—June 10, 1909. No. 5507.

Turbine Blowers (Ueber Turbogebläse.) H. Naville. Reviews their development, theory, construction and operation, and describes installations. Ills. 3100 w. *Stahl u Eisen*—April 7, 1909. No. 4801 D.

Turbine Blowers (Ueber Turbogebläse.) A. Dahme. A review of their theory and development. Ills. 1400 w. *Zeitschr f d Gesamte Turbinenwesen*—April 20, 1909. No. 4800 D.

High-Pressure Turbo-Compressors and the Utilization of Exhaust Steam (Turbo-Compresseurs à haute Pression et Utilisation des Vapeurs d'Echappement). A.

MECHANICAL ENGINEERING

Wind Power

Rateau. Abstracted from the *Revue Universelle des Mines*. Ills. 6500 w. All Indus—April, 1909. No. 4827 D.

Speed Regulation of Electrically Driven Turbo-Blowers (Die Regelung der Umdrehungszahl elektrisch angetriebener Turbogebälse). Herr Scherbius. A description of a special Brown, Boveri & Co. three-phase motor. 1800 w. Stahl u Eisen—April 14, 1909. No. 4856 D.

Wind Power.

Some Ancient Windmills on Cape Cod. Snowden B. Redfield. Illustrates and describes wonderfully well-preserved examples of mechanical skill. 4000 w. Am Mach—Vol. 32. No. 42. No. 8803.

STEAM ENGINEERING

Boiler Design

Wind Power. E. Lancaster Burne. Considers the wind in its relation to wind-mills, the motor, and its applications. Ills. 3000 w. Engr, Lond—March 19, 1909. Serial. 1st. part. No. 3624 A.

Wind Turbines. Brief illustrated description of a recent type. 500 w. Engr, Lond—June 18, 1909. No. 6052 A.

Utilization of Wind Power for Driving Dynamos (Utilisation du Vent comme Force motrice pour Actionner des Dynamos). J. A. Montpellier. A general review of the subject. Ills. 3700 w. L'Electn—Nov. 28, 1908. No. 1116 D.

STEAM ENGINEERING

Air Pumps.

An Improved Form of Air Pump. Describes a form of air pump in which the condensed water and air from the condenser enter the pump by separate inlets. Ills. 1800 w. Prac Engr—Aug. 27, 1909. No. 7643 A.

Experiments on Air-Pumps. Dr. J. Morrow and J. T. Dixon. Describes experiments made. 2000 w. Engng—Nov. 20, 1908. No. 739 A.

Notes on the Design of Vertical Air Pumps. Michael Longridge. Calls attention to a point usually overlooked in the design of vertical single-acting air pumps, and suggests an improved design. Ills. 1200 w. Mech Engr—Sept. 3, 1909. No. 7744 A.

Ash Handling.

See Conveyors, under TRANSPORTING AND CONVEYING.

Boiler Cleaning.

Heat and Water Conserving Systems for Cleaning and Washing Out Boilers. J. E. Epler. Considers the methods in common use for saving the heat in the boilers. 1800 w. Am Engr & R R Jour—Sept., 1909. No. 7575 C.

Boiler Corrosion.

Boiler Corrosion as an Electrochemical Action. C. F. Burgess. Discusses corrosion in steam boilers and the possibility of its being due to electrolytic action. General discussion. Ills. 6000 w. Jour W Soc of Engrs—June, 1909. No. 5878 D.

The Corrosive Action of Magnesian and Other Waters on Steam Boilers. Dr. J. Grossmann. Reviews the investigations

made by H. Ost, published in 1902, and states the results. Also gives method of determining in a general way, the effect of different waters. 2200 w. Engr, Lond—March 12, 1909. No. 3424 A.

The Resistance of Land and Marine Boilers to Corrosion (Résistance des Générateurs de Vapeur industriels et marins aux Altérations corrosives). H. de la Caux. Discusses the causes of corrosion and incrustation in steam boilers. Ills. 5000 w. Tech. Mod—June, 1909. No. 6538 D.

Boiler Design.

Computing Boiler Power. Charles L. Hubbard. Gives simple methods for calculating the size of boilers. 1800 w. Elec Age—Feb., 1909. No. 2510.

Heat Transfer and Future Boiler Practice. Arthur H. Allen. Suggests a new type of boiler on the principle of rapid heat-transference. 4000 w. Power—Sept. 21, 1909. No. 7875.

The Development of a Boiler Horsepower. William Kent. An analysis of the number of square feet of heating surface necessary to develop one horsepower. 2500 w. Ind Engng—Aug. 15, 1909. No. 7178 C.

Propositions and Power of Low-Pressure Heating Boilers. Discusses the effect of restricting the grate area, suitable draft, &c. 2000 w. Dom Engng—June 12, 1909. No. 5511.

Stresses on Cylindrical Shells. H. S. Jeffrey. A mathematical study. 1200 w. Boiler Maker—March, 1909. No. 3078.

Influence of Strap on Lap Boiler Seams. S. F. Jeter. Government tests show that strap must always add some strength to

MECHANICAL ENGINEERING

Boiler Design

the joint. 2000 w. Power—Nov. 24, 1908. No. 469

Strength of Riveted Joints. J. W. Rausch. From a lecture at Baltimore, Md. Gives a mathematical determination of the efficiency of various kinds of riveted joints. Ills. 2000 w. Boiler Maker—Dec., 1908. No. 766.

The Strength of Riveted Joints. J. W. Rausch. Explains different causes of failure in lap and butt joints; how to find the pitch, and to estimate the efficiency of plate and joint. 2500 w. Power—Dec. 15, 1908. No. 1042.

Diagram for Finding Efficiency of Riveted Joints. J. P. Morrison. Gives chart and examples illustrating its use. 1700 w. Boiler Maker—Dec., 1908. No. 768.

The Riveted Joints of Cylindrical Boilers. H. K. Spencer. Discusses only those joints commonly used in cylindrical boilers. Ills. 3500 w. Int Marine Engng—April, 1909. No. 3682 C.

The Riveted Joints of Cylindrical Boilers. H. K. Spencer. Discusses only the joints commonly used in cylindrical boilers. Ills. 4000 w. Boiler Maker—March, 1909. No. 3080.

The Best Form of Longitudinal Joint for Boilers. F. W. Dean. Describes a recommended joint with both straps of the same width. 1000 w. Jour Am Soc of Mech Engrs—Oct., 1909. No. 8521 F.

Best Method of Staying the Front Portion of Crown Sheet (in Radial Stay Boilers) to Prevent Cracking of the Tube Sheet. Abstract of a committee report presented at meeting of Int. Master Boiler Makers' Assn. Gives recommendations. 800 w. Eng News—June 3, 1909. No. 5216.

Graphical Determination of Boiler Bracing. S. F. Jeter. Charts and explanatory notes. Also a description of how the diagrams are made. 2000 w. Power—Sept. 14, 1909. No. 7722.

Bracing Dome Heads. James Smith. Illustrated descriptions of methods used. 1000 w. Power—April 6, 1909. No. 3767.

Reinforced Openings in Boiler Shells. S. F. Jeter. Directions for calculating manhole reinforcements. Ills. 4000 w. Power—Dec. 22, 1908. No. 1080.

Tests on Mild Steel Dished Ends. Translation of an article published in *Zeit. des Ver. Deut. Ing.* in Dec., 1899, describing and giving tabulated results of tests. 2000 w. Engr, Lond—Feb. 12, 1909. Serial, 1st part. No. 2701 A.

See also Flat Plates, under MACHINE ELEMENTS AND DESIGN; and Stacks, under STEAM ENGINEERING.

STEAM ENGINEERING

Boiler Draft.

Mechanical Draft. Charles L. Hubbard. Presents the advantages of mechanical draft and discusses the three systems in common use with stationary boilers. 2000 w. Elec Rev, N Y—Oct. 23, 1909. No. 8781.

Forced Draft for Steam Boilers. W. H. Wakeman. An illustrated article describing the advantages and disadvantages of forced draft, and suggestions relating to its use. 2000 w. Elec Wld—Nov. 7, 1908. Serial. 1st part. No. 97.

A Comparison of Natural and Induced Draught Systems. W. N. Y. King. Read before the Leeds Loc. Soc. of the Inst. of Elec. Engrs. A comparison of results based upon a particular case, under usual conditions. Ills. 5000 w. Elec Engr, Lond—Jan. 1, 1909. No. 1692 A.

Induced Draught in the Power House, and Modern Practice in Its Application. C. L. Browne. Presents the advantages of mechanical draught and discusses some points to be considered in connection with its installation. 2500 w. Elec Engr, Lond—Jan. 8, 1909. Serial, 1st part. No. 1804 A.

The Significance of Drafts in Steam-Boiler Practice. Walter T. Ray and Henry Kreisinger. An illustrated report of experimental investigations in regard to the passage of air through fuel beds and boilers. 12000 w. U S Geol Surv—Bul 367. No. 4116 N.

Boiler Efficiency.

The Economical Production of Steam (Etude sur la Production économique de la Vapeur). M. Izart. The first part of a serial dealing exhaustively with all the factors influencing boiler economy. Efficiency of heat transmission is here considered. Ills. Serial, 1st part. 9500 w. Rev de Mécan—July, 1909. No. 7205 E + F.

Boiler Explosions.

Boiler Explosions During 1908. Annual summary of explosions in the United States, Canada and Mexico. 400 w. Locomotive—Jan., 1909. No. 3189.

Ten Thousand Boiler Explosions. Reviews the number of explosions in the United States and adjacent parts of Canada and Mexico during the period from Oct. 1, 1867, to Jan. 1, 1909. 1800 w. Locomotive—Jan., 1909. No. 3188.

Boiler Explosions in England, Germany, and the United States. Gives a comparison of statistics showing the United States to be far behind in the safe use of high-pressure steam. 2000 w. Locomotive—April, 1909. No. 5544.

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Boiler Explosions

Summary of Boiler Explosions in France During 1907 (Bulletin des Accidents d'Appareils à Vapeur survenus pendant l'Année 1907). Gives the character, circumstances, consequences and supposed causes. 4400 w. Ann d Ponts et Chaussées—1909-IV. No. 7912 E + F.

Compound Boiler Explosions Due to Blocking of Openings to Safety Valves. Editorial on the explosion at Distington, and details of two cases taken from the report of L. E. Fletcher. Ills. 7000 w. Mech Engr—Oct. 8, 1909. No. 8879 A.

Accidents in Boiler Practice (Unfälle im Dampfkesselbetriebe). A report on boiler explosions in the Dartmund-Essen district, Germany. Ills. 2500 w. Glückauf—Sept. 4, 1909. 8662 D.

Disastrous Boiler Explosion at Denver. Illustrated detailed account, with editorial. 2500 w. Power—July 6, 1909. No. 6204.

Boiler Explosion in an Electric Light Plant. An illustrated account of the explosion on June 15, 1909, in Denver, Colo. 4500 w. Locomotive—July, 1909. No. 7506.

The Hull Heating Boiler Explosion. A report of the investigation to determine the cause of the explosion of the high-pressure hot-water boiler in a school building. 3000 w. Mech Engr—Aug. 20, 1909. No. 7431 A.

The Boiler Explosion at the Laura Mine, Egelshoven, Holland (Die Dampfkessel-explosion auf der Grube Laura in Egelshoven, Holland). A. Vierow. Illustrates and describes the explosion and its effects, and discusses its cause. 4000 w. Zeitschr d Ver Deutscher Ing—Jan. 30, 1909. No. 2843 D.

Explosions of Two Boilers at Egelshoven, September 15, 1908 (Intploffing van twee Stoomketels te Egelshoven op 15 September 1908). Report of an investigation of the causes and results. Ills. Serial. 1st part. 7000 w. Ingenieur—Aug. 21, 1909. No. 8158 D.

Notes on the Explosion of Two Boilers at Egelshoven (Opmerkingen over de Ontploffing van twee Stoomketels te Egelshoven). Two articles, by F. van Iterson and Chr. Hovestad. Ills. 5000 w. De Ingenieur—Sept. 4, 1909. No. 8919 D.

Boiler Failures.

Some Recent Board of Trade Reports on Boiler Failures. Brief illustrated reports of 16 cases. 2500 w. Mech Engr—Feb. 19, 1909. No. 2885 A.

Boiler Feeding.

Boiler Feeding (Kesselspeisevorrichtung-en). A. Laponche. Discusses the vari-

STEAM ENGINEERING

Boiler Furnaces

ous types of pumps and methods of driving. Ills. 5500 w. Die Turbine—June 5, 1909. No. 6581 D.

See also Venturi Meters, under MEASUREMENT.

Boiler Firing.

Firing Cheap Grades of Coal Economically. William Kavanagh. Discusses the three methods usually employed in banking, the systems of firing, etc. 1000 w. Elec Wld—Sept. 2, 1909. No. 7530.

Boiler Fittings.

Boiler Fittings. William J. Ranton. Considers only the necessary fittings. 2500 w. Boiler Maker—Dec., 1908. No. 767.

Boiler Blow-Out Valves. Discusses types and their defects. 2000 w. Prac Engr—June 25, 1909. No. 6269 A.

A Study of the Boiler Blowoff. J. C. William Greth. Considers its function and efficiency. 4000 w. Power—Aug. 31, 1909. No. 7411.

Practical Points on the Water Column. J. R. Early. Advice about their location and care. 4000 w. Power—Aug. 24, 1909. No. 7339.

Water Columns and Methods of Connection. W. H. Wakeman. Illustrates and describes a method of connecting water columns to steam boilers. 1200 w. Power—Oct. 12, 1909. No. 8517.

See also Safety Valves, under STEAM ENGINEERING.

Boiler Furnaces.

The Problem of Furnace Design for Water-Tube Boilers. Harold V. Coes. Considers how to remedy some of the defects. 2000 w. Power—Feb. 16, 1909. No. 2501.

Principles of Furnace Design for Smokeless Combustion. C. H. McClure. Read before the Am. Chem. Soc. Discusses the conditions required for smokeless combustion, and types that have proved both smokeless and efficient. 2500 w. Boiler Maker—May, 1909. No. 4182.

Principles of Furnace Design for Smokeless Combustion. C. H. McClure. Read before the Am. Chem. Soc. States the requirements of smokeless furnaces, discussing each. 2500 w. Eng Rec—Nov. 7, 1908. No. 142.

Methods of Studying the Heat-Absorbing Properties of Steam Boilers. Loyd R. Stowe. Explains methods of study that will give facts helpful in determining the arrangement of heating surface that will absorb the highest per cent. of heat. Discussion. 11800 w. Jour W Soc of Engrs—Dec., 1908. No. 1857 D.

MECHANICAL ENGINEERING

Boiler Furnaces

Bridgewalls in Theory and Practice. W. H. Wakeman. Describes defects in bridge-walls, some too low, some too high, etc. 1000 w. Power—March 9, 1909. No. 3039.

Grate Areas for Water-Tube Boilers. T. F. J. Maguire. Considers the relation between the grate area and the kind of fuel used for various types. 3000 w. Engineering Magazine—Oct., 1909. No. 8176 B.

Tube Tiles Used to Form Furnace Roofs. A. Bement. Illustrates and describes the encircling of the lower row of tubes in a water-tube boiler with refractory firebrick tiles to increase efficiency and prevent smoke. 1200 w. Power—April 6, 1909. No. 3766.

An Interesting Method of Renewing a Furnace in a Scotch Boiler. Neil B. Mair. Outlines the usual methods adopted, and describes in detail an economical method of doing the work when economy and dispatch are demanded. Ills. 1000 w. Boiler Maker—Oct., 1909. No. 8378.

See also Fuels, under STEAM ENGINEERING.

Boiler Inspection.

Steam Boiler Inspection. C. M. Hansen. Gives reasons for the enacting of an engineer's license law, and the required construction and inspection of boilers. Ills. 2200 w. Boiler Maker—Dec., 1908. No. 765.

The Inspection of Steam Boilers. James F. Hobart. Remarks on necessary tools and clothes for the purpose, giving a list of questions, and practical instruction. 4500 w. Power—Nov. 24, 1908. No. 468.

Harnessing Power in Greater New York. A. C. Rowsey. An explanation of the work of the Boiler Inspection Bureau, and its great responsibility. 5000 w. Power—April 20, 1909. No. 4046.

Inspection for New York's Low Pressure Boilers. A. C. Rousey. Discusses dangers of so-called low power plants and methods proposed for removing them. 2900 w. Power—June 8, 1909. No. 5321.

Boiler Leakage.

An Experience with Leaky Vertical Fire-Tube Boilers. F. W. Dean. Gives experience and probable cause of the leakage, with the remedy. Ills. 1800 w. Jour Am Soc of Mech Engrs—Oct., 1909. No. 8532 F.

Boiler Management.

Modern Boiler Practice. John W. Hill. Explains present practice, dealing only with standard types. 5500 w. Am Wks Assn—June, 1909. No. 5906 N.

STEAM ENGINEERING

Boiler Management

Care and Management of the Horizontal Tubular Boiler. William Kavanagh. Directions for proper handling to secure economy and reliability. Ills. 1500 w. Power—June 15, 1909. No. 5493.

Care and Management of Water-tube Boilers. William Kavanagh. Directions for shutting down, cleaning and inspecting. 3000 w. Power—June 29, 1909. No. 6023.

Efficiencies of Combustion Processes Compared. Theodore J. Vollkommer. Gives facts that assist in comparing the merits of the different processes, and the general conclusions reached. 3500 w. Ir Age—May 6, 1909. No. 4512.

An Experience in the Boiler Room of a Water Works. Walter L. Watson. Outlines the comparative results obtained with natural draft, and with the "Balanced Draft System of Furnace Regulation," describing this system. Discussion. 3000 w. Pro Am W-Wks Assn—1908. No. 5938 N.

Increasing the CO Content of Flue Gases. A. J. Boardman. Reports an investigation of combustion conditions under ten boilers using bituminous slack. 1500 w. Power—May 18, 1909. No. 4739.

Heat Transmission into Boilers. Henry Kreisinger and Walter F. Ray. Points out possible ways of more fully utilizing this ability in getting both better economy and higher capacities. 4500 w. Power—June 29, 1909. No. 6020.

How Boilers are Ruined. William Olsen. Discusses the troubles due to scale and corrosion, and the best method of preventing such troubles. 1200 w. Boiler Maker—Aug., 1909. No. 6927.

The Dilution of Flue Gases. Wilfred Yorke. A study of the effect of diluting the flue gases with undue admission of air. 1000 w. Power—Sept. 14, 1909. No. 7719.

Scientific Boiler Control. G. A. H. Binz. Before the Inst. of Marine Engrs. Discusses good and bad stoking, advocating the use of CO₂ recorders for the automatic analysis of the products of combustion, and giving an illustrated description of the "Sarco" recorder, type B. 4500 w. Can Engr—Feb. 26, 1909. No. 2868.

Furnace Control and Boiler Testing (Feuerungskontrolle und Dampfkesseluntersuchung). Herr Maercks. A practical paper on boiler management. Ills. 5000 w. Zeitschr d Ver Deutscher Ing—Jan. 23, 1909. No. 2838 D.

Utilization of Waste Heat in Firing with Bituminous Coal (Ueber die Verwertung der Abhitze von Steinkohlen-

MECHANICAL ENGINEERING

Boiler Operation

Feuerungen). M. Kaufhold. Discusses methods of more economical utilization of coal. Ills. 2800 w. Stahl u Eisen—Sept. 1, 1909. No. 8650 D.

See also Hot Water Heating, under HEATING AND COOLING; and Smoke Prevention, under STEAM ENGINEERING.

Boiler Operation.

The Division of Work in a Boiler. T. F. J. Maguire. An analysis of the efficiency of the various parts of the heating surface. 2500 w. Ind Engng—July 15, 1909. No. 6680 C.

Boiler Plants.

The Design of Boiler Plants (Entwurf einer Dampfkesselanlage). Adolf Knelles. A method with simple mathematics. Ills. Serial, 1st part. 1400 w. Elektrotech Rundschau—June 23, 1909. No. 6709 D.

Boiler Rating.

A Standard Rating for Steam and Hot Water Heating Boilers. P. H. Seward. Contribution to committee on Rating House Heating Boilers. Thinks the capacity should be determined by tests made under standard conditions. 3000 w. Met Work—Jan. 23, 1909. No. 2013.

The Rating of House-Heating Boilers. William Kent. Suggests a method of testing small-sized boilers. 900 w. Heat & Vent Mag—Jan., 1909. No. 1886.

The Rating of Domestic Heating Boilers. Konrad Meier. Discusses the fair rating of boilers, and matters related. 2000 w. Met Work—May 29, 1909. No. 5154.

Published Ratings of Heating Boilers Abroad. Review of the published ratings in use in England, France and Germany. 1200 w. Met Work—July 31, 1909. No. 6784.

A British View of Rating Heating Boilers. Full abstract of paper by A. H. Barker, read at Manchester, England. 3000 w. Met Work—July 10, 1909. No. 6245.

Boiler Regulations.

Italian Boiler Requirements. Information concerning the laws and regulations of Italy governing the construction and use of boilers. 1200 w. Power—July 27, 1909. No. 6696.

Boiler Repairs.

Driving Up Bags in Steam Boilers. M. Kennett. Explains the cause of bags and methods of repairing. 1000 w. Power—Jan. 19, 1909. No. 1834.

STEAM ENGINEERING

Boilers

The Diagonal Patch. R. E. McNamara. Describes this method of remedying a bag, where the condition will permit its application, giving calculations and costs. Ills. 1800 w. Boiler Maker—July, 1909. No. 6187.

Putting a Half Sheet on the Bottom of a 66-Inch by 16-Foot Horizontal Tubular Boiler. Henry Mellon. Illustrated detailed description. 2000 w. Boiler Maker—Aug., 1909. No. 6926.

How to Re-tube a Horizontal Tubular Boiler. Henry Mellon. Detailed description. 1000 w. Boiler Maker—Aug., 1909. No. 6928.

Boilers.

The Development of the Downflow Boiler. J. C. Parker. An illustrated explanation of the construction and principles, with related information. Short discussion. 7500 w. Pro Engrs' Club of Phila—Jan, 1909. No. 6359 D.

The Erie City Vertical Water-Tube Boiler. Illustrated description of details of construction, circulation, etc. 1500 w. Ir Age—Aug. 19, 1909. No. 7133.

The "Yorkshire" Boiler. W. H. Casmev. Abstract of a lecture before the Halifax Engrs. & Firemen's Assn. Explains its advantages over any other boiler of the cylindrical type. Ills. 2500 w. Mech Engr—March 12, 1909. No. 3411 A.

New Developments in Boilers and Accessories (Neuerungen auf dem Gebiet des Dampfkesselwesens). Ernst Arnold. Illustrates and describes recent European types of boilers, superheaters, economizers, etc. Serial. 1st part. 3300 w. Stahl u Eisen—Oct. 7, 1908. No. 544 D.

The Jacobi Boiler and Superheater (Der Jacobi-Kessel und Jacobi-Ueberhitzer). C. Forst. Illustrated description. Serial. 1st part. 1500 w. Die Turbine—Nov. 20, 1908. No. 1159 D.

Notes on Water-Tube Boilers (Neuere Anschauungen über Wasserrohrkessel). Herman Garbe. A review of progress in this field. Ills. Serial, 1st part. 1600 w. Zeitschr f d Gesamte Turbinenwesen—Dec. 10, 1908. No. 1956 D.

Sectional Boilers (Gliederkessel). Herr Pradel. An exhaustive discussion of their design and of existing types. Ills. Serial. 1st part. 3000 w. Gesundheits-Ing—Sept. 25, 1909. No. 8688 D.

High-Capacity Water-Tube Boiler with Induced Draught in the Schöneberg Station of the Elektrizitätswerk-Südwest-A.-G. (Hochleistungs-Wasserrohrkessel mit Saugzuganlage im Kraftwerk Schöneberg der Elektrizitätswerk-Südwest-A.-G.)

MECHANICAL ENGINEERING

Boiler Scale

Herr Generlich. Illustrated description with test results. 1800 w. *Zeitschr d Ver Deutscher Ing*—Sept. 4, 1909. No. 8910 D.

See also Pumping, under **HYDRAULIC MACHINERY**.

Boiler Scale.

Concerning Solid Deposits in Steam Boilers. Deals principally with scale formed from dissolved matter that cannot be removed by filtration. Ills. 13000 w. *Locomotive*—Oct., 1908. No. 493.

The Prevention and Removal of Boiler Scale. W. H. Wakeman. First installment of a series of papers on the methods to avoid the formation of scale in a boiler. Ills. 1800 w. *Elec Wld*—June 3, 1909. No. 5275.

Incrustation and Corrosion. R. E. M'Namara. Discusses causes and prevention in steam boilers and pressure vessels. Ills. 3000 w. *Boiler Maker*—March, 1909. Serial. 1st part. No. 3079.

Impurities Causing Scale and Corrosion. J. C. William Greth. Abstract of a paper read before the Am. Inst. of Chem. Engrs. Deals with the general characteristics of salts, gases, and acids which cause scale and corrosion in boilers. 4400 w. *Power*—March 2, 1909. No. 2908.

The Influence of Scale on Heat Transmission in Steam Boilers (De Invloed van Ketelsteen en andere Weerstand op de Warmte-Transmissie bij Stoomketels). Chr. Muller. Reviews much of the literature of the subject. Ills. 5000 w. *De Ingenieur*—Dec. 5, 1908. No. 2116 D.

Boiler Settings.

Steam Boilers and Brickwork. Suggestions for the setting of boilers, with a statement of the advantages of the Poulton setting. 2000 w. *Col Guard*—July 23, 1909. No. 6846 A.

Boiler Tests.

Recent Refinements in Boiler Testing. Albert A. Cary. Illustrated descriptions of apparatus and methods employed. 5500 w. *Power*—Feb. 23, 1909. No. 2719.

Boiler-Room Symposium. Jay M. Whitham. Principally a discussion of boiler testing. 2500 w. *Am W-Wks Assn*—June, 1909. No. 5915 N.

Notes on the Theory of Boiler Testing and Calculations Relating to the Same. Gives a practical example of the calculation of the stresses and factors of safety, introductory to a consideration of the thermal side of boiler testing. 2500 w. *Prac Engr*—Aug. 13, 1909. Serial, 1st part. No. 7317 A.

STEAM ENGINEERING

Boiler Tubes

Tests on Boiler Evaporation at Broken Hill, Block 10. E. F. Stanley Low. Experimental tests to show to what extent the evaporative efficiency could be increased by stoking in such a manner as to increase the percentage of carbon dioxide in the flue gases. Diagrams. 3000 w. *Aust Min Stand*—Nov. 18, 1908. No. 1094 B.

Heat Transmission in Water-Tube Boilers Fired with Inferior Lignite (Der Wärmeübergang am Wasserrohrkessel mit Befuerung durch minderwertige Braunkohle). Paul Fuchs. Gives results of elaborate boiler trials of lignite fuel. Ills. 5800 w. *Zeitschr d Ver Deutscher Ing*—Feb. 13, 1909. No. 3564 D.

Evaporation Tests (Essais de Vaporisation). Victor Lebeau. Details tests on a B. & W. boiler to determine the most economical fuel. Ills. 12000 w. *All Indus*—May, 1909. No. 5733 D.

See also Boiler Management, under **STEAM ENGINEERING**; and Pumping, under **HYDRAULIC MACHINERY**.

Boiler Theory.

The Transmission of Heat Between Fluids. R. M. Neilson. A scientific discussion giving data that can readily be applied in practice. 3500 w. *Engr, Lond*—Feb. 12, 1909. No. 2702 A.

The Laws of Heat Transmission in Steam Boilers, as Deduced from Experiment. John T. Nicholson. Read before the Jr. Inst. of Engrs. Describes methods of investigation, discussing results. 4500 w. *Mech Engr*—Jan. 22, 1909. Serial, 1st part. No. 2212 A.

Heat Transmission. W. E. Dalby. Research work with the aim of presenting a general view of the work which has been done relating to the transmission of heat across boiler heating surfaces. 12000 w. *Inst of Mech Engrs*—Oct. 15, 1909. No. 8763 N.

Boiler Tubes.

The Resistance of Thin Tubes Subjected to External Pressure (Sulla Resistenza dei Tubi a Parete sottile premuti dall'Esterno). G. Rabbeno. Mathematical. Ills. 4000 w. *Riv Marit*—Jan., 1909. No. 2647 E + F.

The Influence of Operation, Diameter and Profile on the Distortion of Boiler Fire Tubes (Einfluss des Betriebes, Durchmesser und Profils auf die Formänderung von Flammrohren). Bruno Müller. Mathematical discussion of stresses in boiler tubes. Ills. 4000 w. *Zeitschr d Ver Deutscher Ing*—May 15, 1909. No. 5964 D.

MECHANICAL ENGINEERING

Boiler-Water Meters

Corrugated Fire Tubes (Betrachtungen an einem Wellblechflamrohr). J. Schmidt. A mathematical discussion of their strength. Ills. 2500 w. Zeitschr d Ver Deutscher Ing—June 5, 1909. No. 6723 D.

The Strength of Oval Tubes under External or Internal Pressure (Résistance des Tuyaux ovales soumis à une Pression intérieure ou extérieure). M. Westphal. Mathematical. Ills. 4000 w. Rev de Mécan—June, 1909. No. 6528 E + F

Boiler-Water Meters.

See Condenser Meters, under STEAM ENGINEERING.

Boiler Waters.

The Boiler Water. Edward Bartow. The troubles caused by water and the remedies are considered. 2500 w. Am W-Wks Assn—June, 1909. No. 5916 N.

Water Supply and Treatment for Power Plant Purposes. William Miller Booth. Gives a classification of waters, their characteristics and treatment required. 4500 w. Am W-Wks Assn—June, 1909. No. 5927 N.

Boiler Feed-Water and Its Treatment. J. R. Campbell. Discusses waters found in the Pittsburg district and the methods and materials used in treating them. 2800 w. Mines & Min—Feb., 1907. No. 2229 C.

The Quality of Surface Waters in the North Central States. R. B. Dole. Presents results of investigations carried out by the U. S. Geol. Survey. Discussion. 9000 w. Pro W Ry Club—Feb. 16, 1909. No. 3193 C.

The Chemical Aspect of Impurities in Steam Boilers. J. C. William Greth. Read before the Am. Inst. of Chem. Engrs. Describes the salts that enter into scale formation, the action of corrosive acids and salts, the requirements to properly soften and purify a water, etc. 6000 w.

Proper Treatment of Boiler Feed Water. A. J. Boardman. Gives data of a plant which reduced maintenance charges \$160 per month by analyzing and treating feed water. 2000 w. Power—March 23, 1909. No. 3438.

Some Useful Lessons of Limewater. Charles S. Palmer. Hints for boiler room tests. Ills. 3500 w. Power—Feb. 2, 1909. Serial, 1st part. No. 2190.

Measuring Boiler Feed Water. W. R. Degenhardt. Illustrates and describes Harding's revolution counter. 900 w. Aust Min Stand—March 3, 1909. No. 3881 B.

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The Technical Examination of Boiler Waters. A paper by W. A. Hargreaves read before the Australasian Assn. for the Adv. of Science, with letters discussing statements made. 3000 w. Eng News—May 20, 1909. No. 4780.

Scaling and Corroding Substances and Their Elimination from Water for Boilers. J. C. William Greth. Abstract of a paper before the Scranton Engrs' Club. Considers the harmful substances in solution in waters. 1500 w. Power—June 22, 1909. No. 5812.

Prevention of Scale-Formation in Steam Boilers by Electricity. F. A. Lart. Extract from an article in the *Engng. Rev.* A report of recently conducted experiments in the application of electricity to water purification. 2500 w. Ry & Engng Rev—Jan. 23, 1909. No. 2041.

Effect of Oil in Steam Boilers. J. E. Terman. Describes bags caused by oil, and matters relating to the subject. 1600 w. Power—Nov. 3, 1908. No. 43. Ind Wld—Jan. 1, 1909. No. 1477.

See also Boiler Corrosion, and Feed-Water Heating, under STEAM ENGINEERING; Analysis, under CIVIL ENGINEERING, WATER SUPPLY; Rand, under MINING AND METALLURGY, GOLD AND SILVER; and Locomotive Feed Water, under RAILWAY ENGINEERING, MOTIVE POWER AND EQUIPMENT.

Condenser Meters.

The "Lea" Water-Recorder. Illustrated description of a new apparatus and its operation. 1700 w. Engng—Aug. 13, 1909. No. 7326 A.

The Lea Continuous Engine Recorder. William H. Booth. Illustrated description of an English device to record water rate of engines, and other uses. 3000 w. Power—Aug. 31, 1909. No. 7413.

Condensers.

Condensers. S. K. Patterson. Considers the general theory of condensers, types, difficulties in design and operation, and related matters. 2500 w. Elec Rev, N Y—Nov. 28, 1908. No. 499.

The Theory of Steam Condensers. Thomas C. McBride. A statement of the fundamental laws governing the operation of condensers, the measurements to be taken, and the instruments employed. Discussion. 4500 w. Pro Engrs' Club of Phila—Oct., 1908. No. 4322 D.

Condensers and the Economy of Their Use. Charles L. Hubbard. Discusses the action and economy of the usual types as compared with a non-condensing plant

Condensers

using exhaust steam for heating. Ills. 5000 w. Power—Dec. 22, 1908. No. 1081.

Steam Condenser Design and Practice. Dr. Joseph H. Hart. An illustrated explanation of the characteristics, management and efficiency of various types. 2000 w. Engineering Magazine—July, 1909. No. 5976 B.

Condensers (Quelques Condenseurs). A review of recent types and recent researches on the influence of vacuum and of circulation on their efficiency. Ills. Serial, 1st part. 5000 w. Rev de Mécan—Jan., 1909. No. 2624 E + F.

The Choice of a Condenser. Francis Hodgkinson. Discusses the different types and points out the particular applications of each. 3000 w. Elec Jour—July, 1909. Serial, 1st part. No. 6436.

Notes on Condensing and Water-Cooling Plants. E. Lunn. Read before the Incor. Munic. Elec. Assn. Considers types of condensers and their efficiency, wet and dry air pumps, steam and electrically driven pumps, and water-cooling plants. 4000 w. Mech Engr—June 25, 1909. No. 6271 A.

Notes on Condensing and Water Cooling Plants. F. Lunn. Read before the Incor. Munic. Elec. Assn. Considers types of condensers and cooling plants. 4500 w. Elec Engr, Lond—Sept. 3, 1909. No. 7726 A.

The Relationship Between Condenser and Air Pump. R. M. Neilson. Considers partial pressures, factors influencing the transmission of heat from the steam to the condensing water, the air-pump's influence on the condenser, and condenser's influence on the air-pump. 4500 w. Engr, Lond—Aug. 6, 1909. No. 7107 A.

Determining the Amount of Injection Water Required to Condense Exhaust Steam. A. W. Empson. Gives chemical method of ascertaining the ratio between injection water and steam. 1200 w. Elec Rev, Lond—Aug. 6, 1909. No. 7089 A.

English Practice in Condensing Equipment. James A. Seager. A general survey of British practice and methods of design with particular reference to surface condensers. Ills. 3500 w. Power—Sept. 14, 1909. No. 7718.

Design of Condenser and Cooling Tower Plants. Abstract of a paper by M. R. Bump before National Electric Light Association, which discusses the fundamental features of condensing plants. 3500 w. Eng Rec—June 5, 1909. No. 5280.

Development of the Surface Condenser.

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Warren O. Rogers. Illustrates and describes types, beginning with Watt's, and including the most modern apparatus. 1600 w. Power—Feb. 9, 1909. Serial, 1st part. No. 2379.

Development of the Surface Condenser. George A. Orrok. Gives an account of the surface condenser before and after the advent of the steam turbine. Ills. 4500 w. Power—June 1, 1909. No. 5173.

Researches on Surface Condensers for Steam Turbines (Versuche über Oberflächenkondensationen, insbesondere für Dampfturbinen). E. Josse. An exhaustive investigation of the whole condensation problem. Ills. Serial. 1st part. 5500 w. Zeitschr d Ver Deutscher Ing—Feb. 27, 1909. No. 3571 D.

Surface-Condensers for Steam Turbines. An editorial review of a paper by Prof. E. Josse, before the Schiffbautechnische Gesellschaft, on "Surface-Condensation for Steam-Turbines, Especially for Ships." 5000 w. Engng—Dec. 11, 1908. No. 1358 A.

Saturated Air as a Cooling Agent. Arthur Pennell. Illustrates and describes the Pennell condensers. 1200 w. Power—Jan. 12, 1909. No. 1664.

Evaporative Condenser at Southend. Illustrated description of a very large plant embodying the latest improvements. 1500 w. Engr, Lond—April 23, 1909. No. 4468 A.

The Design of Marine Condenser Plants (Die Konstruktive Ausbildung von Kondensationsanlagen an Bord von Seeschiffen). Hans Vogel. A discussion both theoretical and practical. Ills. Serial, 1st part. 2000 w. Zeitschr f d Gesamte Turbinenwesen—Jan. 30, 1909. No. 2697 D.

The Westinghouse-Leblanc Condenser. Edwin Yawger. From an address before the Assn. of Ir. & St. Elec. Engrs. Illustrates and describes the essential features and gives information regarding their use. 2500 w. Ir Age—Aug. 5, 1909. Np. 6890.

Westinghouse-Leblanc Condenser at the Lambrecht Pit of the Anzin Mines (La Condensation par Mélange système Westinghouse-Leblanc, à la Fosse Lambrecht, des Mines d'Anzin). Ch. Dantin. Describes a large installation. Ills. 3000 w. Génie Civil—July 17, 1909. No. 7231 D.

The Leblanc Ejector Condenser. Illustrated description of the rotary air-pump and condenser invented by Maurice Leblanc. 700 w. Engng—May 7, 1909. No. 4725 A.

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The Design of Suction and Delivery Pipes for Condensing Plants. Discusses points in the design. 3500 w. *Elec Rev*, Lond—April 23, 1909. No. 4448 A.

A Novel Condenser Design. Edwin Yawger. From a paper before the Assn. of Ir. & St. Elec. Engrs. Illustrates and describes the Leblanc condenser. 1700 w. *Eng News*—Aug. 19, 1909. No. 7143.

Bimetallic Condenser Tubes. Edward K. Davis. Shows the durability of such tubes and considers the comparative effects of the copper-aluminium combination upon the design and efficiency of a condenser. 1800 w. *Eng News*—Sept. 2, 1909. No. 7536.

Tinsley's Patent Condenser. Illustrated description. 1200 w. *Col Guard*—Sept. 3, 1909. No. 7746 A.

A Remarkable Condenser Performance. A report of results obtained with Wheeler surface condenser in the Williamsburg power station, Brooklyn, N. Y. 2000 w. *Power*—Sept. 28, 1909. No. 8144.

A Remarkable Condenser Performance. Reports success attained with a Wheeler "dry tube" condenser installed in the Williamsburg power station, Brooklyn, N. Y. Ills. 2000 w. *Ind Engrg*—Sept. 15, 1909. No. 8048 C.

The Consummate Evaporative Condenser. Illustrated description of this condenser as installed in the Bermondsey supply station, with some figures of tests and costs. 800 w. *Engr*, Lond—Oct. 1, 1909. No. 8498 A.

See also same title, under MARINE AND NAVAL ENGINEERING; Turbines, and Air Pumps, under STEAM ENGINEERING; and Steam Engines, under MARINE AND NAVAL ENGINEERING.

Condensing Plants.

Pumps and Turbines for Condensing Plants. Illustrated description of plants where the water used for condensing is made to perform useful work. 700 w. *Engr*, Lond—May 14, 1909. No. 4971 A.

Cooling Towers

See same title, under HEATING AND COOLING; and Condensers, under STEAM ENGINEERING.

Economizers.

A Suggestion for Overloaded Boiler Plants. Carl S. Dow. An illustrated explanation of the value of an economizer. 2500 w. *Engineering Magazine*—June, 1909. No. 4989 B.

A Practical Talk on the Economizer. Warren H. Miller. An illustrated dis-

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cussion of how to handle economizers, and matters related. 3000 w. *Power*—July 27, 1909. No. 6699.

Engine Balancing.

Steam Engine Counterbalancing. F. H. Ball. Describes the problem of balancing and describes an engine in which practically perfect balance has been achieved by simple means. 2000 w. *Ir Age*—March 18, 1909. No. 3215.

Engine Bearings.

Hot Bearings; Some Causes and Remedies. H. S. Brown. Diagrams. 2000 w. *Power*—April 6, 1909. No. 3768.

Engine Capacity.

Charts to Determine Engine and Generator Capacities in Direct Connected Units. N. A. Carle. Gives charts, and illustrates their use by examples. 600 w. *Power*—Aug. 24, 1909. No. 7336.

Engine Cylinders.

Thick Cylinders. P. M. Gallo. Gives formulæ commonly used to calculate the thickness for a given pressure, and a diagram based on formula developed by the writer. 3000 w. *Mach*, N Y—July, 1909. No. 6668 C.

Cylinder Condensation and the Temperature of Cylinder Walls. R. Royds. A theoretical and experimental study of the receptivity and emissivity of a surface in contact with steam. 3500 w. *Engr*, Lond—Oct. 15, 1909. No. 8945 A.

Engine Defects.

Discoveries of Engineers. W. H. Wake-man. Experiences of operating engineers, describing causes and remedies of defects. Ills. 3500 w. *Power*—Oct. 19, 1909. No. 8769.

Engine Design.

Present-Day Practice in High-Speed Engine Design. Considers points that govern the design and some of the details found successful. 1500 w. *Mech Wld*—Jan. 8, 1909. Serial. 1st part. No. 1815 A.

Current Practice in Steam Engine Design. Ole N. Trooien. An investigation of current practice in proportioning steam engine parts, giving formulæ showing the general trend. 5000 w. *Bul Univ of Wis*, No. 252—Oct., 1908. No. 2735 C.

Steam Engine Design. The present article discusses general proportions, cylinder ratios, cut-off and expansions, temperature range and pressures. 1200 w. *Prac Engr*—March 26, 1909. Serial, 1st part. No. 3782 A.

MECHANICAL ENGINEERING

Engine Design

The Design of Turning Engines. Edward M. Bragg. Discusses important details in the design. Ills. 2200 w. *Int Marine Engng*—Oct., 1909. No. 8324 C.

Offsetting Cylinders in Single-Acting Engines. Prof. Thurston M. Phetteplace. A discussion of the claims of superiority made for this form of condensation. 5500 w. *Jour Am Soc of Mech Engrs*—Feb., 1909. No. 2406 F.

The Ideal Piston Pin. Horace L. Arnold. Aims to show that a very large diameter, soft-steel piston pin can be placed without trouble, and that fixing the piston pin in the rod end is better in every way than fixing the pin in the piston bosses. Ills. 1200 w. *Am Mach*—Vol. 32. No. 34. No. 7348.

Engine Efficiency.

The Efficiency of Heat Engines. R. W. Angus. Read before Toronto Univ. Engng. Soc. Considers the limitations of such engines and their possibilities. 3000 w. *Mech Wld*—March 12, 1909. No. 3414 A.

See also Steam Engines, under MARINE AND NAVAL ENGINEERING.

Engine Erection.

Erecting an Engine. F. Wiegand. Considers the different operations of building. Ills. 1600 w. *Power*—Sept. 14, 1909. No. 7720.

Erecting an Engine. F. Wiegand. Detailed directions for the work. 2000 w. *Power*—Sept. 21, 1909. No. 7873.

Erecting an Engine. F. Wiegand. The present article deals with the piston and reciprocating parts. 3000 w. *Power*—Sept. 28, 1909. No. 8145.

Engine Failures.

Some Recent Steam Engine Failures. Howard S. Knowlton. Illustrates and describes accidents reported by the engineering expert of a casualty co. 3000 w. *Power*—Jan. 12, 1909. No. 1663.

Steam Engine Breakdowns and Their Lessons. Michael Longridge. Abstract from report for 1908 of the Chief Engineer to the British Engine, Boiler, and Electrical Insurance Co., Ltd. Ills. 4000 w. *Mech Engr*—Sept. 3, 1909. No. 7743 A.

Engine Flywheels.

Variation in Angular Velocity of Flywheels. Alex. R. Horne. Describes a method of determining the variation in angular velocity and the angular lag and lead of an engine fly-wheel from the diagram of crank effort by means of a planimeter. 1500 w. *Engng*—May 28, 1909. No. 5363 A.

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Engine Operation

Engine Foundations.

Building an Engine Foundation. Notes on the building of a typical concrete foundation, to carry a large high-speed engine and generator. Ills. 1800 w. *Elec Rev*, Lond—Sept. 24, 1909. No. 8342 A.

See also Foundations, under CIVIL ENGINEERING, CONSTRUCTION.

Engine Governing.

Governors and the Speed Regulation of Steam Engines. Prof. G. F. Charnock. Deals particularly with pendulum governors. 2500 w. *Mech Engr*—Nov. 27, 1908. Serial. 1st part. No. 857 A.

Engine Governors. William Matthews. A short discourse on the requirements, size, power, etc., of governors necessary to control engines or engine valve gear. Ills. 1200 w. *Prac Engr*—Oct. 1, 1909. Serial. 1st part. No. 8473 A.

Recent Shaft Governors (Neuere Flachregler mit regelbarer Umlaufszahl). R. Proell. Illustrated description and discussion of the Proell governor. 2700 w. *Zeitschr d Ver Deutscher Ing*—April 10, 1909. No. 5072 D.

Engine Lubrication.

Forced Lubrication. Henderson B. Gregory. An illustrated general description of the installation and operation as applied to large marine reciprocating engines. 1200 w. *Jour Am Soc of Nav Engrs*—Feb., 1909. No. 4058 H.

Lubricators and Lubrication. W. H. Wakeman. Discusses these features of steam and gas engine work, describing types of lubricators. Ills. 2500 w. *Power*—Sept. 7, 1909. Serial. 1st part. No. 7603.

Automatic Engine Lubrication with Gravity Feed. Romyn Hitchcock. Illustrated description of the Mille apparatus. 2000 w. *Power*—Sept. 7, 1909. No. 7601.

Lubricants for Cylinders. John M. Sewell. Explains the conditions to be met and considers the requisite qualities for cylinder lubrication. 2400 w. *Power*—Feb. 9, 1909. No. 2378.

See also Lubricants and Lubrication, under POWER AND TRANSMISSION.

Engine Management.

See Isolated Plants, under ELECTRICAL ENGINEERING, GENERATING STATIONS.

Engine Operation.

Analysis of Steam and Inertia Forces. F. W. Hollman. Graphical explanation of the inertia forces of a tandem-compound engine and their combination with the

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Engine Pistons

steam forces in each cylinder. 1200 w. Power—April 6, 1909. No. 3765

Engine Pistons.

Pistons and Piston Valves. The first of a series of illustrated articles deals principally with piston packings, and the principles under which packing rings should work. 4000 w. Engr, Lond—June 18, 1909. Serial, 1st part. No. 6047 A.

Engine Pressures.

Expensive versus Inexpensive Back Pressure. W. H. Wakeman. Describes interesting examples, pointing out defects. Ills. 4500 w. Power—March 30, 1909. No. 3586.

The Influence of Steam Pressure, Speed of Rotation, and Number of Expansions Upon the Mean Effective Pressure and Steam Consumption of Steam Engines. R. Royds. Discusses the best methods of experimenting in this field. Diagrams. 4500 w. Inst of Engrs & Shipbldrs in Scotland—April 27, 1909. No. 4609 N.

Engine Relief Valves.

Relief Valves. Remarks on their Design. Ills. 1000 w. Mech Wld—Nov. 20, 1908. No. 726 A.

Engines.

Engineering in the Eighteenth Century. Edward P. Buffet. Illustrates and describes quaint engines used, and features of steam engineering practice. 4000 w. Power—March 30, 1909. No. 3587.

Engineering in the Eighteenth Century. Edward P. Buffet. Illustrates engines used 150 years ago. 4200 w. Am Mach—Vol. 32. No. 26. No. 6095.

New York's First Corliss Engine. Thomas Wilson. Illustrates and describes the "Enterprise," in service since 1851 almost continuously, and good for many years to come. 1000 w. Power—June 29, 1909. No. 5021.

Business Aspects of Early Engineering. H. W. Dickinson. Notes on the ways of conducting business in the early days of the introduction of the steam engine. 3000 w. Engr, Lond—Dec. 25, 1908. No. 1544 A.

Development of the High Speed Steam Engine. Abstract of lecture by Frank H. Ball before the Modern Science Club of Brooklyn, N. Y. Why the compound single valve engine is preferable where high efficiency is necessary. 2000 w. Power—Jan. 19, 1909. No. 1833.

The Growth of the High Speed Engine. Extract from a paper by Prof. John E. Sweet, read before the Modern Science

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Engines

Club, Brooklyn, N. Y. Ills. 2200 w. Am. Mach—Vol. 32. No. 33. No. 7165.

A High-Speed Corliss Engine. Samuel S. Webber gives the history of an engine built in the years 1876-1877. Ills. 1200 w. Cassier's Mag. Aug., 1909. No. 7039 B.

Design of an English High-Speed Steam Engine. Philip Bellows. Discusses an engine of the semi-superposed type, calling attention to noteworthy features. Ills. 4500 w. Power—Nov. 3, 1908. No. 42.

Modern British High-Speed Steam Engines. John Davidson. Describes current British practice. Ills. 3500 w. Power—Feb. 9, 1909. Serial, 1st part. No. 2376.

Compound Horizontal Engine with Recke-Ruston Valve-Gear. Illustrated description of a large compound side-by-side engine designed to work with superheated steam. 700 w. Engng—Jan. 1, 1909. No. 1705 A.

New Compound Tandem Condensing Engine for Sheet Mills. Illustrated description of engine recently installed at the Eclipse Ironworks, Glasgow. Plate. 1200 w. Ir & Coal Trds Rev—April 9, 1909. No. 4044 A.

Compound Semi-Portable Engine and Superheater. Brief illustrated description of an engine of this type. 900 w. Engr, Lond—April 9, 1909. No. 4040 A.

Tandem Compound Condensing Semi-Portable Engine. An illustrated description of Wolf's semi-portable engine, with report of tests undertaken to ascertain the steam and coal consumption, efficiency, and general working. 3000 w. Engng—Oct. 8, 1909. No. 8893 A.

The "Lowca" High-Pressure Engine. Illustrated description of an engine designed to work with steam at pressures of as much as 1000 lbs. per square inch, and at temperatures up to 1000 deg. Fahr. 1000 w. Engng—June 25, 1909. No. 6280 A.

The Lanz Locomobile. Illustrated description of an engine exhibited at Olympia which has many unusual features. 1500 w. Engr, Lond—Dec. 4, 1908. No. 1024 A.

Lanz Portable Engines with Lentz Valves (Industrie-Locomobilen mit Ventilsteuerung "System Lentz" der Firma Heinrich Lanz in Mannheim). Fr. Freytag. Illustrated description. Serial. 1st part. 1300 w. Elektrotech Rundschau—April 24, 1909. No. 5060 D.

A New Experimental Engine. Illustrated description of an experimental engine of the drop valve type. 700 w. Engr, Lond—Oct. 15, 1909. No. 8951 A.

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Engines

Economy of Four Valve Engines. Thomas Hall. A defense of this type, with criticism by F. W. Dean. 3000 w. Power—June 22, 1909. No. 5814.

Steam Engines with Poppet Valves (Machines à Vapeur, Etude sur les Machines à Soupapes). E. Lefer. An explanation of their high steam consumption. Ills. 2000 w. Rev de Mécan—June, 1909. No. 6525 E + F.

See also Gas vs. Steam, under POWER AND TRANSMISSION; Steam Engines, under MARINE AND NAVAL ENGINEERING; and Hoisting Engines, under MINING AND METALLURGY, MINING.

Engine Speed.

Piston Speed. Gives a table of actual piston speed, illustrating by example, and explaining method of calculating. 800 w. Mech Wld—Feb. 5, 1909. No. 2480 A.

Engine Tests.

Tests on a Wolf Superheated Steam Portable Engine (Versuche mit einer Heissdampf-lokomobile von R. Wolf). Herr Gutermuth und Watzinger. Reports tests on a 100-140 horse power tandem engine. Ills. 3000 w. Zeitschr d Ver Deutscher Ing—Oct. 3, 1908. No. 598 D.

Tests on a Wolf Compound-Tandem, Semi-Portable Engine with Superheater (Essais exécutés sur une nouvelle mi-fixe compound-tandem à Surchauffe, la Maison R. Wolf). Herr Gutermuth. Translation from *Zeitschr. d. Ver. Deutscher Ing.* Ills. 2300 w. Rev. de Mécan—May, 1909. No. 5707 E + F.

Engine Theory.

The Function of Compression. R. T. Strohm. Shows that compression in steam engines is not only desirable, but a necessity. 2000 w. Power—Feb. 16, 1909. No. 2502.

Entropy.

The Question of Entropy. A paper by J. Swinburne, replying to a previous paper by Prof. S. A. Reeve, with also a reply by Prof. Reeve to Mr. Swinburne's paper. 6000 w. Harvard Engng Jour—Nov., 1908. No. 1322 D.

The Entropy Diagram and Its Application to Steam (Die Entropiefunktion und ihre Anwendung auf Wasserdampf). J. W. Haeussler. Refers particularly to the thermo-dynamics of the steam turbine. Serial. 1st part. 2000 w. Die Turbine—Oct. 20, 1908. No. 568 D.

Entropy Diagram.

Diagram of the Properties of Saturated and Superheated Steam at Various Tem-

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Flue-Gas Analysis

peratures and Pressures (Diagramme des Propriétés de la Vapeur saturée et surchauffée aux différentes Pressions et Températures). J. Izart. Describes an entropy diagram taking account of the variation of the specific heat with temperature and pressure. Ills. 4000 w. Rev de Mécan—Feb., 1909. No. 3322 E + F.

Exhaust Steam.

See Turbine Plants, under STEAM ENGINEERING.

Feed-Water Heating.

Means and Methods for Heating the Feed Water of Steam Boilers. Reginald Pelham Bolton. First of a series of three articles examining the economy of feed-water heating. Ills. 3000 w. Engineering Magazine—Dec., 1908. No. 672 B.

Means and Methods of Heating the Feed Water of Steam Boilers. Reginald Pelham Bolton. Discusses the economy of heating by live steam, in this second article of a series. Ills. 2000 w. Engineering Magazine—Jan., 1909. No. 1331 B.

Means and Methods for Heating the Feed-Water of Steam Boilers. Reginald Pelham Bolton. This third and last article of a series examines the economy of heating feed-water by exhaust steam. Ills. 1600 w. Engineering Magazine—Feb., 1909. No. 2158 B.

Relative Rate of Heat Transfer to Water At and Below the Boiling Point. W. M. Sawdon. Reports some tests made at Sibley College laboratory, giving results. 1500 w. Power—Jan. 12, 1909. No. 1661.

Flue-Gas Analysis.

Flue Gas Analysis. Arthur E. Jones. Abstract of paper read before the Staffordshire Ir. & St. Inst. Shows the value of analysis, giving methods of procedure and results. 3000 w. Ir & Coal Trds Rev—April 9, 1909. No. 4045 A.

Description, Installation and Economy of CO₂ Recorders. Will F. McKnight. Ills. 2500 w. Pro Soc of Ap Sci—Session 1908-1909. No. 4095 C.

Formulas for Computing the Results of Gas Analysis. Frank B. Shields. Gives formulae for calculations of results of analyses of chimney gases. 600 w. Power—June 22, 1909. No. 5817.

Real Relation of CO₂ to Chimney Losses. James E. Steely. Shows the lack of reliability in determining chimney losses without considering hydrogen, CO, and moisture. 2700 w. Power—June 8, 1909. No. 5323.

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Fuel Contracts

Simplified Results From Flue Gas Analyses. Frank Kingsley. Gives a formula based on the percentage of nitrogen to establish the percentage of excess air, with explanation and diagrams illustrating their use. 1800 w. Eng Rec—Aug. 21, 1909. No. 7308.

The "Krell" Continuous CO₂ Recorder. Diagram and description with explanation of the method of operation. 1500 w. Elec Engr, Lond—May 14, 1909. No. 4942 A.

Fuel Contracts.

See same title, under MARINE AND NAVAL ENGINEERING; and Fuels, under STEAM ENGINEERING.

Fuel Gas.

See Gas Producers, under COMBUSTION MOTORS.

Fuel Oil.

Unnecessary Losses in Firing Fuel Oil and an Automatic System for Eliminating Them. C. R. Weymouth. Explains the principle of operation, details of construction, and results in trial of the Moore-Patent automatic fuel oil regulating system. Ills. 6500 w. Jour Am Soc of Mech Engrs—Dec., 1908. No. 839 F.

Fuel Economy Tests. Discussion of two papers by C. R. Weymouth on tests of fuel oil. 3500 w. Jour Am Soc of Mech Engrs—March, 1909. No. 3466 F.

Fuel Economy Tests. Discussion of paper by C. R. Weymouth. 2800 w. Jour Am Soc of Mech Engrs—June, 1909. No. 5345 F.

Calorific Value of California Fuel Oil. R. W. Fenn. A tabulated comparison of crude oils of different densities, with related information. 2000 w. Eng News—May 13, 1909. No. 4647.

Oil Furnaces and the Economical Handling of Oil as Fuel. Jno. E. Ulrich. Considers the methods of atomizing the oil, the construction of the furnaces and the economy. 2500 w. Ir Trd Rev—June 3, 1909. No. 5230.

See also Oil Fuel, under MARINE AND NAVAL ENGINEERING.

Fuels.

A Comparison of the Heating Powers of Fuels. A. L. Hodges. Brief consideration of natural and artificial fuels. 2000 w. Min Wld—Sept. 25, 1909. No. 8084.

Characteristics of Bituminous Coals and Low Grade Fuels. C. M. Ripley. Examines figures presented by W. E. Crane. 1800 w. Power—Sept. 7, 1909. No. 7604.

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Fuels

Coal: What It Is and How It Was First Burned. Warren O. Rogers. Gives early experience with anthracite coal, and discusses its formation. Ills. 2000 w. Power—July 13, 1909. No. 6312.

Some Fundamental Considerations on Coal. W. Jones. Considers the use of coal in raising steam and the importance of analysis, and of building the furnace to suit the coal to be used. 1300 w. Elec-Chem & Met Ind—Jan., 1909. No. 1676 C.

Coal; Its Composition and Combustion. William H. Booth. Discussion of the elements which combine to promote combustion. 3000 w. Power—Jan. 12, 1909. No. 1662.

Coal Specifications and Tests. A. V. Doane. Discusses things to be considered in specifying, methods of sampling and testing, etc. 2500 w. Power—Feb. 2, 1909. No. 2187.

Fuel Economy Tests at a Large Oil Burning Electric Power Plant Having Steam Engine Prime Movers. C. R. Weymouth. Presents results of fuel economy tests at the Redondo Plant, near Los Angeles, Cal. 6500 w. Jour Am Soc of Mech Engrs—Mid-Nov., 1908. No. 653 F.

The Temperature Obtainable with Ordinary Fuels (Welche Temperaturen können wir mit unseren gewöhnlichen Brennstoffen erreichen?). Josef v. Ehrenwerth. A mathematical discussion of the chemistry of the combustion of carbonaceous fuels. Serial, 1st part. 1600 w. Oest Zeitschr f Berg- u Hüttenwesen—Jan. 16, 1909. No. 2670 D.

Efficiency of Domestic Fuels. John H. Wyman. Report of a series of tests made at Ann Arbor, Mich., for the purpose of ascertaining the relative value of commercial fuels as used in house heating boilers. Discussion. 4000 w. Pro Age—Oct. 1, 1909. No. 8242.

Tests of Coal and Briquets as Fuel for House-Heating Boilers. D. T. Randall. Describes the method of conducting the tests, giving data and results, and conclusions. Ills. 9800 w. U S Geol Surv—Bul. 366. No. 2781 N.

The Economy of Fuel. William Kent. Read at the Pan-American Congress, Dec., 1908. A discussion of fuel wastes, and methods of economically using coal. 5000 w. Ind Engng—May, 1909. No. 4784 C.

The Selection and Purchase of Coal for Boiler Furnaces. D. T. Randall. Parts of an address before the Ill. Fuel Con. Suggestions for designing small steam power plants, discussing certain characteristics of coal and their influence. 2500 w. Eng News—April 8, 1909. No. 3856.

Fuels

Selection of Coal for Boiler Furnaces. D. T. Randall. Read at Ill. Coal Conference. Considers the effect of furnace design, and the influence of certain characteristics of coal. 3500 w. Power—April 6, 1909. No. 3770.

I. Results of Purchasing Coal Under Government Specifications. John Shober Burrows. II. Burning the Small Sizes of Anthracite for Heat and Power Purposes. Dwight T. Randall. Gives the general plan and results. 9800 w. U S Geol Surv—Bul. 378. No. 4526 N.

The Purchase of Municipal Coal Supplies in New York City. Information from a report by Messrs Walter N. Polakov and William A. Russell to the Board of Apportionment of New York, on preventable wastes and losses in the plants of the municipal government of the city. 3000 w. Eng Rec—March 20, 1909. No. 3269.

The Purchase of Fuel on a British Thermal Unit Basis. Lawrence P. Crecelius. Explains the method adopted in Cleveland, Ohio, of purchasing coal on the basis of calorific value. 4000 w. Pro Am Inst of Elec Engrs—June, 1909. No. 5383 F.

The Purchase of Coal Upon a Heat Value Contract. Edward H. Taylor. Considers the causes that have led to the purchase of coal upon specifications, the contract, and related subjects. 18000 w. Am W-Wks Assn—June, 1909. No. 5928 N.

Some Industrial Applications of Pulverized Coal. William D. Ennis. Discusses its preparation, handling, applications, difficulties, &c. Discussion. 14000 w. Pro Brooklyn Engrs' Club, No. 81—1908. No. 5872 F + F.

Low-Grade Fuels and the Power Plant. C. M. Ripley. Considers the relative values of steam fuels, use of coke screenings, low-grade fuels, etc. 2000 w. Elec Wld—April 1, 1909. No. 3754.

Coals for Hand-Fired Steam Plants. D. T. Randall. Reports results of tests that show that almost any character of coal may be burned with reasonable efficiency. Diagrams. 1500 w. Am W-Wks Assn—June, 1909. No. 5911 N.

Peat and the Production of Power. Herbert Philipp. Considers ways of using peat for power and heating purposes. 2500 w. Elec-Chem & Met Ind—March, 1909. No. 2988 C.

An Experimental Study of Bagasse and Bagasse Furnaces. E. W. Kerr and E. M. Percy. Reports and investigation of the methods of utilizing the heat from this

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fuel, and the furnace used. Ills. 40000 w. Louisiana Bul No. 117—Aug., 1909. No. 8504 N.

Tan Bark as a Boiler Fuel. David Moffat Myers. Considers the characteristics of wet spent tan bark as a boiler fuel. 6500 w. Jour Am Soc of Mech Engrs—Oct., 1909. No. 8530 F.

See also Boiler Tests, under STEAM EN-
Peat, Shrinkage, and Texas, under MIN-
ING AND METALLURGY, COAL AND
COKE; and Locomotive Fuels, under
RAILWAY ENGINEERING,, PERMA-
NENT WAY AND BUILDINGS.

Fuel Specifications.

The Purchase of Coal by the City of New York. Extracts from a report by Otto H. Klein, concerning present practice and proposed specifications based on heat units contained. 1700 w. Eng News—Sept. 9, 1909. No. 7627.

Fuel Testing.

Comparative Tests of Coal. Peter H. Bullock. Describes a simple testing apparatus and tests made. 1800 w. Power—March 16, 1909. No. 3185.

Government Tests of Coal as Fuel for House Heating Boilers. Reviews the U. S. Geol. Survey tests on sectional steam boilers, at St. Louis, and on sectional cast-iron and round boilers at Urbana. Ill. 5000 w. Heat & Vent Mag—March, 1909. No. 3452.

Heat Value of Coal from Dulong's Formula, Based on Ultimate Analysis. N. A. Carle. Aims to cover the determination of the probable total heat of combustion from the chemical analysis, and gives a chart showing graphically the heat value as calculated by this formula. 800 w. Power—May 11, 1909. No. 4587.

Heating-Value Tests on Coal, Coke and Anthracite (Heizwertversuche an Kohlen, Koks und Anthrazit). Hans Winkelmann. Describes the method of making calorimeter tests and gives results. Serial. 1st part. 1700 w. Giesserei-Zeitung—Feb. 15, 1909. No. 3372 D.

See also Calorimetry, under MEASURE-
MENT; and Analysis, under MINING
AND METALLURGY, COAL AND COKE.

Fuel Purchasing.

Efficiency in the Purchase of Fuel for Power Generation. Walter N. Polakov. Discussion of wastes and their prevention. 3500 w. Engineering Magazine—Nov., 1909. No. 8833 B.

The Purchase of Coal by the B. t. u. Method. Samuel A. Taylor. Read before Am. Min. Cong. A study of the significance and consequences of putting

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this method of purchase into practical operation. 3500 w. Min Wld—Oct. 9, 1909. No. 8460.

Heat.

Heat: Its Use and Distribution. Lyman C. Reed. Briefly explains the phenomena of heat transference, considers some of its properties and uses, and outlines the relation of various heat storage elements and their use. 6000 w. Jour Assn of Engng Socs—Aug., 1909. No. 8057 C.

Heat Storage.

Heat Accumulation in Steam Engineering. L. A. Battu. Briefly reviews the development of thermal storage plants, describing special apparatus and explaining when it can be made useful. Ills. Also discussion. 10500 w. Pro N Y R R Club—Oct. 16, 1908. No. 205.

Heat Transmission.

The Transmission of Heat Through Boiler Plates. The first of a series of articles aiming to concentrate all the useful information concerning the transmission of heat to water under the ordinary conditions of steam generation. 4500 w. Engr, Lond—Feb. 19, 1909. Serial. 1st part. No. 2900 A.

See also Boiler Theory, under STEAM ENGINEERING.

Indicator Diagrams.

Indicator Diagrams. W. A. Tookey. Read before the Assn. of Engrs.-in-Charge. Gives some cards and discusses the causes of distortion and the remedies. 1800 w. Mech Wld—March 19, 1909. Serial. 1st part. No. 3610 A.

Inaccuracies Due to Drum Motion Distortion. Julian C. Smallwood. Analysis of the cause of errors in indicator diagrams, with results of tests. 2500 w. Power—Jan. 26, 1909. No. 2089.

Inaccuracies of Indicator Diagrams. Julian C. Smallwood. Discusses the distortion of pencil motion, inaccuracies in mechanism and spring and methods of calibration. Ills. 2500 w. Power—March 16, 1909. No. 3184.

Some Suggestive Indicator Diagrams. W. G. McKellor. Discusses diagrams of a number of engines running from 10 to 30 horsepower. 4000 w. Jour W of Scotland Ir & St Inst—Nov. and Dec., 1908. No. 2431 N.

Indicators.

The Hopkinson Flashlight Indicator. Illustrated description of an indicator for high speeds. 800 w. Engng—Dec. 11, 1908. No. 1216 A.

STEAM ENGINEERING

Piston Rings

See also Steam Engines, under MARINE AND NAVAL ENGINEERING.

Injectors.

The Working Process in Injectors (Untersuchungen über den Arbeitsvorgang im Injektor). G. Schrauff. Describes and gives results of elaborate tests. Ills. Serial, 1st part. 6000 w. Zeitschr d Ver Deutscher Ing—May 15, 1909. No. 5963 D.

Researches on the Operation of Injectors (Recherches sur le Fonctionnement des Injecteurs). G. Schrauff. Describes tests on Körting and Siemens injectors and gives results. Ills. 8500 w. Rev de Mécan—Sept., 1909. No. 8603 E + F.

Mechanical Stokers.

Recent Developments in Machine Stoking. A. W. Bennis. Read before the Bradford Engng. Soc. Considers the best known types of mechanical firing apparatus, their improvements, and the effect of modern requirements. 1200 w. Elect'n, Lond—Feb. 5, 1909. Serial, 1st part. No. 2580 A.

A New Bennis High-Temperature Coking-Stoker. Illustrated description of coking-stoker claiming high efficiency. 1500 w. Engng—Feb. 19, 1909. No. 2894 A.

Mechanical Stokers (Mechanische Feuerungen). Karl Rubricius. A description and discussion of several German types. Ills. 2200 w. Elektrotech u Maschinenbau—Dec. 27, 1908. No. 1996 D.

Recent Boiler Stoking Plants Built by Carl Schenck, Darmstadt (Neuere Kesselbekohlantlagen gebaut von Carl Schenck, Darmstadt). Oskar Brix. Illustrates the arrangement of bunkers, conveying devices and mechanical stokers in several plants. Serial, 1st part. 5500 w. Zeitschr d Ver Deutscher Ing—March 6, 1909. No. 4291 D.

Oil Fuel.

See Fuels, under STEAM ENGINEERING; and Oil Fuel, under MARINE AND NAVAL ENGINEERING.

Oil Separators.

Elimination of Oil from Condensed Steam. George H. Gibson. Discusses methods of removal. 1500 w. Power—Aug. 24, 1909. No. 7338.

Piston Rings.

Piston Packing Rings. James Andrews. Read before the W. of Scotland Assn. of Foremen Engrs. Shows that the same packing rings do not behave alike in all cases, and gives a study of their action under various conditions. Ills. 6500 w. Mech Engr—March 12, 1909. No. 3412 A.

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Piston Speed

Piston Packing Rings. James Andrews. Abstract of paper before the W. of Scotland Assn. of Foremen Engrs. Shows that the same packing rings do not behave alike in all cases, and discusses the principle of their action. Ills. 3500 w. Mech Wld—June 4, 1909. Serial. 1st part. No. 5520 A.

Piston Speed.

A Simple Method of Determining the Acceleration of an Engine Piston (Méthode simple pour le Calcul des Accélération du Piston d'une Machine). Armand Duchesne. Mathematical. Ills. 2000 w. Bul Sci de l'Assn des Elèves—Feb., 1909. No. 4204 D.

Safety Valves.

I. Safety Valves. Frederic M. Whyte. II. Safety Valve Capacity. Philip G. Darling. Two papers with discussion. Ills. 18300 w. Jour Am Soc of Mech Engrs—April, 1909. No. 3966 F.

Safety Valve Capacity. Philip G. Darling. Illustrates and describes a method employed to determine safety valve lifts, giving results of tests. 4500 w. R R Age Gaz—March 5, 1909. No. 3032.

Auld's Safety Valves for Low Pressure. Describes two designs of new safety valves more particularly adapted for low pressure steam. Ills. 950 w. Mech Engr—May 28, 1909. No. 5402 A.

Some Recent Developments in Marine Safety-Valves. J. Hamilton Gibson. Reports tests which indicate a striking advance in safety-valve design. Ills. 800 w. Engng—Feb. 26, 1909. No. 3070 A.

A Cause of Rupture of Safety-Valve Seats (Sur une Cause de Rupture des Sièges de Soupapes). L. Lecornu. A discussion of faults due to improper casting. 1200 w. Rev de Mécan—Dec., 1908. No. 2102 E + F.

Smoke Prevention.

Smoke Prevention or Smoke Consumption. Harold V. Coes. First of series of articles discussing smoke prevention in stationary steam-boiler practice, deals with the causes of smoke and the methods and devices which tend to make possible smokeless combustion in hand-fired furnaces. 3500 w. Engineering Magazine—June, 1909. No. 4988 B.

Smoke Prevention or Smoke Consumption. Harold V. Coes. This second article of a serial discusses automatic stokers, describing leading types. Ills. 5500 w. Engineering Magazine—July, 1909. No. 5972 B.

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Smoke Prevention

Smoke Prevention or Smoke Consumption. Harold V. Coes. Third and concluding paper of a series. Deals with the choice of apparatus for burning various grades of fuel, and with the application of automatic stokers to marine and locomotive service. Ills. 2500 w. Engineering Magazine—Aug, 1909. No. 6748 B.

Smoke and Smoke Prevention. L. P. Breckenridge. Reviews the principles of smokeless combustion, discusses furnaces, their construction and operation. Ills. 8500 w. Am W-Wks Assn—June, 1909. No. 5921 N.

Smokeless Combustion. Charles L. Hubbard. Considers firing and furnace construction in their relation to the prevention of smoke. 2000 w. Elec Rev, N Y—Dec. 5, 1908. Serial. 1st part. No. 823.

A Practical Study in Smoke Prevention. H. S. Knowlton. Gives results of recent tests made on a large New England plant, and the remedies suggested. 2200 w. Power—Dec. 29, 1908. No. 1315.

Smoke Prevention. D. T. Randall. Paper read at Syracuse meeting of the Int. Assn. for Prevention of Smoke. Discusses the relation of the character of coals to the prevention of smoke. 1800 w. Sci Am Sup—June 26, 1909. No. 5896.

The Smokeless Combustion of Coal in Boiler Plants, with a Chapter on Central Heating Plants. D. T. Randall and H. W. Weeks. States the problem and discusses its solution. Ills. 30000 w. U S Geol Survey—Bul. 373. No. 5696 N.

The Relation of the Character of Coals to the Prevention of Smoke. D. T. Randall. Read at Syracuse meeting of the Int. Assn. for the Prevention of Smoke. Gives analyses of fuels, discussing furnace conditions and management, and related matters. 1800 w. Boiler Maker—Oct., 1909. No. 8380.

The Prevention of Smoke. Wilfred Yorke. Remarks on the essentials of modern practice and the success of their applications. 1200 w. Elec Rev, Lond—July 2, 1909. No. 6293 A.

Smoke Abatement. Sir William B. Richmond. Remarks on the damage caused by smoke, introductory to a discussion. 5000 w. Jour Roy Inst of Brit Archts—May 22, 1909. No. 5594 C.

Rules for Smokeless Consumption of Fuel. Robert Grimshaw. Discussion of rules laid down by the "Magdeburger Verein für Dampfkesaelbetrieb." 1300

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Smoke Prevention

w. Eng & Min Jour—June 5, 1909. No. 5304.

Industrial Smoke Prevention in Hamburg. John B. C. Kershaw. Information in regard to the work of the Hamburg Smoke Abatement Society. 1800 w. Elec Rev, N Y—Oct. 23, 1909. No. 8782.

The Reduction of Smoke in Factory Districts (Zur Frage der Rauchverminderung im Industriebezirke). Dr. Klocke. Discusses the smoke nuisance in cities and describes methods and apparatus designed to lessen it. Ills. 2800 w. Stahl u Eisen—Feb. 3, 1909. No. 3358 D.

Stacks.

Furnace Draught in Central Heating Plants (Die Unterdruckverhältnisse im Innern einer Zentralheizungs-Kesselanlage). M. Hottinger. A theoretical discussion of chimney design and draught. Ills. 4000 w. Gesundheits-Ing—Dec. 5, 1908. No. 1964 D.

See also same title, under CIVIL ENGINEERING, CONSTRUCTION.

Steam Calorimeters.

Steam Calorimeters. Charles N. Cross. Illustrated description of the Barrus "Universal" steam calorimeter and its working. 1200 w. Power—Dec. 29, 1908. No. 1316.

Steam Compression.

The Application of the Compression of Steam to the Evaporation of Industrial Liquids (Application de la Compression de la Vapeur à l'Evaporation des Liquides industriels). Ch. Prache and Ch. Bouillon. A discussion of practice. Ills. 8800 w. Mem Soc Ing Civ de France—April, 1909. No. 5712 G.

The Compression of Steam and Its Application to Evaporation (De la Compression de la Vapeur appliquée à l'Evaporation). Jean Rey. Discusses the phenomena of steam compression, compressing machinery and the use of compressed steam in the evaporation of aqueous solutions, etc. Ills. 7500 w. Mem Soc Ing Civ de France—April, 1909. No. 5711 G.

Steam Consumption.

The Steam Consumption in an Open Cooking Tank. G. Everett Quick. Illustrated report of tests made to determine the average quantity of steam used per pound of treated fat. 2000 w. Eng Rec—June 26, 1909. No. 6004.

Steam Generation.

The Law of Mixed Vapors Applied to the Steam Plant. W. H. Booth. Ex-

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plains why the law does not always hold good. 2500 w. Power—Aug. 10, 1909. No. 6994.

Steam Headers.

Diameter of Steam Headers. Franz J. Denk. Gives a table for different horsepower, pressures and velocities, with explanation. 900 w. Power—Sept. 7, 1909. No. 7602.

Steam Loop.

The Inception of the Steam Loop. James H. Blessing. Describes this device and its operation. 1500 w. Power—Aug. 31, 1909. No. 7412.

Steam Meters.

Steam Meters (Dampfmesser) F. Bendemann. Illustrated description of various types. Serial, 1st part. 5200 w. Zeitschr d Ver Deutscher Ing—Jan. 2, 1909. No. 2833 D.

Steam Pipes.

The Design of Pipes. T. E. Thain. Discusses the primary considerations and methods of determining dimensions, dealing especially with steam pipes. 1200 w. Prac Engr—Aug. 20, 1909. Serial. 1st part. No. 7428 A.

The Theory of the Design of Pipes for the Transmission of Saturated and Superheated Steam (Zur Theorie der Berechnung von Rohrleitungen für gesättigte und überhitzte Dämpfe). Dr. M. Wierz. Mathematical. 3000 w. Gesundheits-Ing—Nov. 7, 1908. No. 1169 D.

High Pressure Steam Piping Systems. William F. Fischer. Notes on recent design, including a discussion of expansion, vibration, pipe and pipe fittings, etc. 4000 w. Power—Feb. 23, 1909. No. 2720.

The Strength of Oval Pipes under External or Internal Fluid Pressure (Festigkeit von ovalen Röhren gegen innern oder äusseren Flüssigkeitsdruck). M. Westphal. A mathematical demonstration of the method of calculation. Ills. 2000 w. Zeitschr d Ver Deutscher Ing—Dec. 26, 1908. No. 2109 D.

Materials for Pipe Lines. William D. Ennis. Discusses the most suitable material for piping, fittings, and valves used in power house installations. Ills. 2000 w. Power—Sept. 21, 1909. No. 7872.

Selection and Safety of Pipe Fittings. A. J. Dixon. Discusses the effect on the safety factor of faulty fittings to steam pipes. 1800 w. Power—Dec. 15, 1908. No. 1043.

Flanged Pipe Joints for High Pressure. William F. Fischer. Illustrates and describes types of screwed joint, shrunk,

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peened and riveted; variations in lap joints, and the welded flanges. 2500 w. Power—March 2, 1909. No. 2907.

Improved Coupling for Copper Pipes. Illustrates and describes an improved method invented by William Bryce. 500 w. Engr, Lond—Feb. 12, 1909. No. 2705 A.

Leaky Steam Pipe Joints and What Causes Them. William F. Fischer. Faults due to poor design of the piping system are discussed, and other causes and remedies. 1500 w. Power—Aug. 10, 1909. No. 6996.

Pipe-Hangers. W. H. Wakeman. Illustrates and describes a variety of convenient devices. 1800 w. Elec Wld—March 4, 1909. No. 2993.

Pipe Supports. A. Houlson. Illustrates and describes standard types, and suggestions for their use. 1200 w. Mech Engr—Jan. 22, 1909. No. 2211 A.

Danger from Water Hammer in Steam Pipes. Howard S. Knowlton. Gives examples of damage to pipes and valves, explaining how to avoid water hammer. Ills. 2000 w. Power—April 20, 1909. No. 4048.

Explosion of Steam Pipes Due to Water Hammer. C. E. Stromeyer. Read before the Inst. of Nav. Archts. An account of investigations giving diagrammatic representations of typical cases of water-hammer, with notes. 4500 w. Mech Engr—April 9, 1909. No. 4029 A.

Prevention of Water Hammer in Steam Pipes. Charles L. Hubbard. Discusses causes and cures. Ills. 2000 w. Met Work—March 6, 1909. No. 2981.

Drawing High-Pressure Steam Lines. William F. Fischer. Discusses the effect of water collecting in the steam piping, and methods of drawing it. Ills. 3000 w. Power—March 9, 1909. No. 3040.

The Action of Air and Steam on Pure Iron. J. Newton Friend. Read before the Iron & Steel Inst. A report of research work. 3000 w. Engng—Oct. 15, 1909. No. 8933 A.

See also Pipe Bending, under HEATING AND COOLING; Copper, under MATERIALS OF CONSTRUCTION; and Valves, and Water Hammer, under STEAM ENGINEERING.

Steam Properties.

The Total Heat of Saturated Steam. Dr. Harvey N. Davis. Proposes a new formula for the range from 212 to 400 deg. the accuracy of which is believed to be within about 0.1 per cent. 3500 w.

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Jour Am Soc of Mech Engrs—Nov., 1908. No. 644 F.

The Total Heat of Saturated Steam. Dr. Harvey N. Davis' paper is discussed. 5000 w. Jour Am Soc of Mech Engrs—Feb., 1909. No. 2411 F.

Heat in Steam. Joseph H. Hart. An explanation of the connection between heat and steam and related matters. 2000 w. Power—Jan. 26, 1909. No. 2092.

Energy in a Pound of Steam. Fred. R. Low. Demonstrates that the net energy of expansion from 150 pounds down to atmospheric pressure approximates energy from atmospheric pressure down to 27½ inches of vacuum. 3000 w. Power—Feb. 2, 1909. No. 2186.

Energy Charts for Steam. R. M. Neilson. Gives charts prepared by the writer with explanation of their use. Plate. 1500 w. Power—March 16, 1909. No. 3187.

Some Properties of Steam. Prof. R. C. H. Heck. Gives experimental results as to the relation between pressure and temperature of saturated steam, and the specific heat of water. 3000 w. Jour Am Soc of Mech Engrs—May, 1909. No. 4413 F.

The Specific Volume of Saturated Steam. Prof. C. H. Peabody. Gives a comparison of experimental and computed values with explanations. 2200 w. Jour Am Soc of Mech Engrs—May, 1909. No. 4407 F.

The Solution of Steam Problems by the Use of a Diagram. Lionel D. Marks. Gives a diagram of total heat entropy, showing pressures, qualities and specific volumes, with explanations and solutions of problems. 5000 w. Eng News—Aug. 26, 1909. No. 7358.

Formulæ Connecting the Pressure and Temperature of Saturated Steam. S. Godbeer. Reviews briefly the data available, and develops a new formula. 1500 w. Engng—Aug. 6, 1909. No. 7102 A.

The Basis of Engine and Boiler Calculations. A critical discussion of methods used. 1500 w. Mech Engr—Oct. 15, 1909. No. 8881 A.

A New Determination of the Saturation Pressure of Steam Between 50 and 200 Degrees (Eine neue Bestimmung des Sättigungsdruckes von Wasserdampf zwischen 50 und 200°). L. Holborn and F. Henning. Report from the Physikalisch-Technischen Reichsanstalt. 2200 w. Zeitschr d Ver Deutscher Ing—Feb. 20, 1909. No. 3569 D.

Banki's Steam Diagram (Diagramme de M. Banki pour la Vapeur d'Eau). Translated from *Zeitschrift für das Gesamte Turbinenwesen*. Gives a diagram showing

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Steam Separators

the temperature drop in calories in adiabatic expansion with explanation of its use. Ills. 2500 w. *Rev de Mécan*—Nov., 1908. No. 1110 E + F.

See also Entropy Diagram, and Superheated Steam, under STEAM ENGINEERING.

Steam Separators.

Some Live Steam Separator Tests. G. F. Gebhardt. Describes tests made at Armour Inst. of Technology, and states the conclusions drawn. 1000 w. *Power*—May 11, 1909. No. 4586.

Stokers.

The Characteristics of Automatic Stokers. T. K. Roberts. Considers the construction and operation of various types. Ills. 5000 w. *Ind Engng*—June, 1909. Serial. 1st part. No. 5802 C.

The Seyboth Mechanical Stoker (Die Rostbeschickungsvorrichtung Bauart Seyboth). W. Hofmann. Illustrated description. 2200 w. *Zeitschr f d Gesamte Turbinenwesen*—May 10, 1909. No. 5778 D.

Stoking.

Firing Cheap Grades of Fuel. William Kavanagh. Briefly outlines methods of firing that will avoid smoke. 1000 w. *Power*—Nov. 17, 1908. No. 296.

Methods of Firing Cheap Grades of Bituminous Coal. William Kavanagh. Describes briefly the six ways in which soft coal can be fired. 1000 w. *Elec Wld*—May 6, 1909. No. 5036.

Methods of Firing Soft and Hard Coal. William Kavanagh. Suggestions for firing and for cleaning the furnace. 1200 w. *Elec Wld*—July 1, 1909. No. 6109.

Firing Stationary Boilers Economically. F. R. Wadleigh. Suggestions on methods of firing, regulation of air supply; cleaning, kindling and banking fires, and smoke prevention. 7000 w. *Power*—Dec. 8, 1908. No. 877.

The Training of Firemen in Central Stations (L'Education Professionnelle du Personnel Chauffeur dans les Stations Centrales). J. Izart. Discusses the essentials of good boiler firing and means of obtaining it. Ills. 3500 w. *L'Elec*—Oct. 17, 1908. No. 529 D.

Firemen (Du Chauffeur). Ant. Michot. Discusses the training of firemen, the principles of economical stoking, the Liège firemen's competition, etc. Serial. 1st part. 4000 w. *All Indus*—Feb., 1909. No. 3328 D.

The Skill of Firemen (L'Habileté professionnelle des Chauffeurs). J. Izart. Gives the results of an annual firemen's

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competition at Lille for six years showing how much firemen may be improved by careful training. 2000 w. *L'Elec*—Jan. 9, 1908. No. 2629 D.

See also Smoke Prevention, under STEAM ENGINEERING.

Superheated Steam.

Thermal Properties of Superheated Steam. Discussion of the paper by Prof. R. C. H. Heck. 1400 w. *Jour Am Soc of Mech Engrs*—Nov., 1908. No. 645 F.

See Engine Tests, under STEAM ENGINEERING.

Superheaters.

Superheaters. Frank Hugh Preece. Brief discussion of their design and advantages, with illustrated descriptions of the principal types now in use. 3500 w. *Inst of Civ Engrs*—No. 3719. No. 2790 N.

See Boilers, under STEAM ENGINEERING.

Superheating.

The Properties of Superheated Steam. Henry T. Eddy. Gives results of recent experimental investigations as to the specific heat of superheated steam, aiming to place the information in a form readily applicable. Charts. 1500 w. *Minn Engr*—March, 1909. No. 4065 C.

Superheat and Its Advantages. Vernon Smith. Considers the advantages and difficulties of superheating. 2500 w. *Prac Engr*—March 19, 1909. No. 3605 A.

Superheated Steam. James A. Seager. Considers the advantages and disadvantages of superheating, and the three systems most used. 2800 w. *Cent Sta*—Aug., 1909. No. 6997.

Superheated Steam. Thomas Sugden. Deals with both the principles and practice of superheating. Ills. 8500 w. *Pub Works*—Jan-March, 1909. No. 5642 D.

Discussion. Thermal Properties of Superheated Steam. Brief abstract of paper by R. C. H. Heck, with author's reply to discussion. 900 w. *Jour Am Soc of Mech Engrs*—Jan. 1909. No. 1852 F.

Cast Iron Fittings and Superheated Steam. John Primrose. Disproves the theory that ordinary superheat is destructive to cast-iron fittings. 2500 w. *Power*—June 8, 1909. No. 5322.

A New Principle in Superheaters. Illustrated description of the "Unit Superheater," which provides a system of expanded flows. 1200 w. *Ir & Coal Trds Rev*—April 23, 1909. No. 4475 A.

Superheated Steam (La Vapeur d'Eau surchauffée). L. Marchis. A review of

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Superheating

the properties of superheated steam and of the design and operation of superheating apparatus. Ills. Serial. 1st part. 4500 w. Tech Mod—April, 1909. No. 4830 D.

Superheating in Marine Practice (L'Application de la Surchauffe aux Moteurs de Navires.) O. H. Wildt. Discusses the application and economy of superheated steam in marine engines and turbines, superheaters, etc. Ills. 4000 w. Génie Civil—April 17, 1909. No. 4840 D.

See also Pumping Engines, under HYDRAULIC MACHINERY; and Power Plants, under POWER AND TRANSMISSION.

Thermodynamics.

Thermodynamics in Theory and Practice. Considers the points requiring further investigation and the present value of the theory. 1500 w. Engr, Lond—June 11, 1909. No. 5634 A.

Turbine Balancing.

The Mass Balancing of Steam Turbine Rotors. W. H. Heaton. Describes practical methods of balancing in the shop. 1500 w. Cassier's Mag—Sept., 1909. No. 7780 B.

Turbine Design.

The Design of the de Laval Steam Turbine. A brief summary of the stages of design, giving the formulae involved. 2000 w. Prac Engr—Jan. 1, 1909. No. 1689 A.

The Design of Steam Turbines (Sul "Calcolo" delle Turbine a Vapore). G. B. Dall'Armi. A mathematical demonstration of the method employed. Ills. 7000 w. Riv Marit—Oct., 1908. No. 538 E + F.

The Design of Steam Turbines (Sul Calcolo delle Turbine a Vapore). G. B. Dall'Armi. A theoretical discussion with curves plotted from fundamental equations. Ills. 8000 w. Ann d Soc d Ing e d Arch Ital—Dec. 1, 1908. No. 1934 F.

The Design of Thrust Bearings for Horizontal and Vertical Turbine Machinery (Kammlagerkonstruktionen sowie deren Berechnung bei Turbomaschinen mit Horizontaler und vertikaler Welle). Emil Gutmann. Describes types and discusses the principles of design. Ills. 2700 w. Die Turbine—July 5, 1909. No. 7287 D.

Turbine Efficiency.

Steam-Turbine Efficiency. Editorial on the inaccuracy of the statement that the efficiency is less when the number of stages is increased. 2500 w. Engng—Feb. 19, 1909. No. 2895 A.

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Turbine Governors.

Determining the Capacity of an Oil-Pressure Turbine Governor (Ueber die Wahl des Arbeitsvermögens eines Turbinen-Oel-druck-Reglers). A Pfau. Mathematical discussion of the determination of the size of the regulating cylinder. Ills. 3000 w. Die Turbine—Aug. 5, 1909. No. 7973 D.

See also Operation, under ELECTRICAL ENGINEERING, GENERATING STATIONS.

Turbine Losses.

The Internal Losses of a Steam Turbine. A. G. Christie. Review and analysis of tests made in England, with a view to determining where losses occur and their nature. Ills. 3500 w. Power—Aug. 24, 1909. No. 7335.

Turbine Nozzles.

The Temperature Gradient in De Laval Steam-Nozzles (Abridged). Cyril Batho. Describes researches made to determine the temperature gradient along a steam-turbine nozzle. 4000 w. Inst of Civ Engrs—No. 3713. No. 3205 N.

The Design of Steam Turbine Nozzles (Die Düsen der Dampfturbinen und die Berechnung ihrer Dimensionen). J. W. Haeussler. Theoretical and mathematical. Serial, 1st part. 3000 w. Die Turbine—March 20, 1909. No. 4272 D.

Turbine Operation.

Running a Westinghouse Steam Turbine. Explains important points of present-day practice. Ills. 2500 w. Power—July 13, 1909. Serial, 1st part. No. 6315.

Windage Losses in Steam Turbines with Partial Admission (Ventilationsverlust in Dampfturbinen mit Teilbeaufschlagung). -W. J. Jasinsky. Mathematical discussion and report of investigations. Ills. Serial, 1st part. 5500 w. Zeitschr d Ver Deutscher Ing—March 27, 1909. No. 4297 D.

Turbine Plants.

Typical Low-Pressure Steam Turbine Plant. J. R. Bibbins. A double-flow turbine utilizing the exhaust of two 750-kw. Corliss engines is described. Ills. 2000 w. Power—March 16, 1909. No. 3183.

Plant in Public Service Building, Milwaukee. Osborne Monnett. Illustrated description of a large non-condensing turbine plant, operating against 22 pounds absolute back pressure, to furnish exhaust steam for district heating. 2500 w. Power—March 9, 1909. No. 3037.

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Remarkable Plant of the St. Clair Tunnel. Osborn Monnett. Illustrates and describes a turbine plant able to carry a load varying instantly from zero to 100 per cent. overload. 3500 w. Power—June 29, 1909. No. 6019.

A Notable Low Pressure Turbine Installation. Illustrated description of a Rattau regenerator and a 600 K. W. turbo-generator set at Vandergrift, Pa., supplying direct-current at 250 volts. 2500 w. Ir Age—Jan. 7, 1909. No. 1495.

Exhaust-Steam Turbine Plant at the Osterfeld Mine (Die Abdampfturbinenanlage der Zeche-Osterfeld). K. J. Müller. Illustrated description of the plant and its working and report of its economy. 3000 w. Glückauf—Dec. 5, 1908. No. 1951 D.

The Exhaust Steam Turbo-Generator Plant at the Zollverein Mine (Die Abdampf-Turbogeneratoranlage auf Zeche Zollverein., Schacht 4/5). Describes a 900-kw. installation and discusses its economy. Ills. 2000 w. Zeitschr f d Gesamte Turbinenwesen—April 10, 1909. No. 4881 D.

Turbine Regulation.

Steam-Turbine Regulation and its Influence on the Power Output of the Individual Pressure Stages (Die Regelung von Dampfturbinen und ihr Einfluss auf die Leistungsentwicklung in den einzelnen Druckstufen). Herbert Baer. Considers the effect of various methods of regulation. Ills. Serial, 1st part, 3500 w. Zeitschr d Ver Deutscher Ing—July 3, 1909. No. 7466 D.

Turbines.

Steam Turbines. H. A. Hussey. An illustrated explanation of types and their operation. 2500 w. Cal Jour of Tech—March, 1909. No. 3948.

Steam Turbines. Gerald Stoney. Considers the subject of steam turbines and their development during the last 25 years, briefly discussing prime movers in general. Ills. 9500 w. Jour Soc of Arts—Oct. 8, and 15, 1909. Serial. 2 parts. No. 8824 each A.

A Review of Steam Turbine Development. Discussion of the progress of different types of turbines, with a consideration of their shortcomings. 3500 w. Engr, Lond—May 28, 1909. No. 5265 A.

The Increased Expansion of Steam Attainable in Steam Turbines. Hon. C. A. Parsons. The James Watt lecture at Greenock. The fundamental principles of steam, discovered by Watt and their ap-

plications, especially in steam turbines. 5000 w. Nature—Feb. 25, 1909. No. 3043 A.

Steam and Gas Turbines (Les Turbines à Vapeur et les Turbines à Gaz). Paul Razous. A discussion of their mechanical and thermodynamic features. 3500 w. Rev d'Econ Indus—July 16, 1909. No. 7204 D.

The Development of Steam Turbines, Particularly of the Impulse Type (Du Développement des Turbines à Vapeur et particulièrement de la Turbine à Action). M. Reuter. Translation from *Zeitschrift des Vereines Deutscher Ingenieure*. Ills. 5000 w. All Indus—Nov., 1908. No. 1118 D.

The Large Steam Turbine in the Electrical Industry (Die Beziehungen der Gross-Dampfturbine zur Elektrotechnik). Herr v. Groddeck. A comparison of its economy with that of the reciprocating engine. Ills. 4500 w. Die Turbine—Aug. 5, 1909. No. 7974 D.

The Steam Turbine in English Power Houses. James A. Seager. Gives reasons for its popularity in electrical work. Ills. 3000 w. Power—Sept. 7, 1909. No. 7597.

Steam Turbines, from the Users' Point of View. Alfred S. Blackman. Read before the Incor. Munic. Elec. Assn. Statements regarding reliability and economy of impulse and reaction types; considering also equipments, economy and related matters. 3000 w. Mech Engr—June 25, 1909. No. 6270 A.

The Development of the Small Steam Turbine. Charles A. Howard. Illustrates and describes features of design and construction of leading types of small capacity turbines used in the United States. 2500 w. Engineering Magazine—Dec., 1908. No. 673 B.

The Development of the Small Steam Turbine. Charles A. Howard. This second, and concluding part discusses the service applications to which this type of prime mover is particularly adapted. 4000 w. Engineering Magazine—Jan., 1909. No. 1327 B.

Small Steam Turbines. George A. Orrok. Treats of the smaller sizes from the standpoint of the designing and operating engineer, describing the commercial machines and giving facts concerning their operation. 2000 w. Jour Am Soc of Mech Engrs—May, 1909. No. 4411 F.

Small Steam Turbines. Discussion of George A. Orrok's paper. 9500 w. Jour Am Soc of Mech Engrs—Sept., 1909. No. 8097 F.

Steam Turbines of Low Power (Einiges über Dampfturbinen für geringe Leist-

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ung). R. Roskowitz. A discussion of their development, types, design, etc. Ills. Serial. 2200 w. Zeitschr f d Gesamte Turbinenwesen—Nov. 10, 1908. No. 1160 D.

Small Steam Turbines (Les petites Turbines à Vapeur). Jules Vinsonneau. Refers particularly to the uses of, and results obtained with, the Brien turbine. Ills. 3500 w. Rev Indus—April 10, 1909. No. 4828 D.

The Field and Future of the Low-Pressure Steam Turbine. Ira N. Hollis. This first article of a series discusses the fundamental theory and fields of usefulness. 4000 w. Engineering Magazine—April, 1909. No. 3524 B.

The Field and Future of the Low-Pressure Steam Turbine. Ira N. Hollis. This second paper of a series considers the development and applications of low-pressure turbines to stationary service in America. Ills. 2500 w. Engineering Magazine—May, 1909. No. 4338 B.

The Low-Pressure Steam Turbine. R. M. Neilson. An illustrated explanation of their efficiency and use. 4500 w. Power—July 6, 1909. No. 6200.

The Low Pressure Steam Turbine. Charles B. Burleigh. Abstract of a paper read before the Nat. Assn. of Cotton Mfrs. Discusses the uses to which it may be applied with advantage. 2500 w. Power—Nov. 17, 1908. No. 295.

Low Pressure Steam Turbines. C. H. Smoot. Read before the N. E. L. A. Claims that turbines are not dependent on accurate workmanship for their reliability, and that simplicity and reliability go together. Explains the advantages of low-pressure turbines. Also editorial. Ills. 9500 w. Elec Age—June, 1909. No. 6132.

The Utilization of Exhaust Steam in Low-Pressure Turbines. R. F. Halliwell. Read before the Rugby Engng. Soc. Discusses the more important features of low-pressure turbine plants, showing the economies that can be effected by their use. 2500 w. Mech Engr—Jan. 29, 1909. Serial, 1st part. No. 2352 A.

Low Pressure and Mixed Turbines. Examples of installations of Rateau apparatus with information related. 1500 w. Power—Oct. 19, 1909. No. 8770.

Low Pressure or "Exhaust" Steam Turbines. J. A. Moyer. Discusses their efficiency and applications. 2200 w. Mich Tech—Feb., 1909. No. 4071 D.

The Low Pressure Turbine Combined with the Steam Engine. Edwin D. Dreyfus. A study of the application of the low-pressure turbine under certain definite

conditions, showing a method of determining the relation between the various elements considered which will give the most satisfactory operation. Ills. 3000 w. Elec Jour—Oct., 1909. No. 8526.

Steam Turbines with High Back Pressure (Dampfturbinen mit hohem Gegen-druck). H. Wagner. Discusses their operation in a number of cases. Ills. 2500 w. Zeitschr f d Gesamte Turbinenwesen—Jan. 9, 1909. No. 2695 D.

The Utilization of Steam in Low-Pressure Turbines (Abdampfverwertung und neuere Abdampfanlagen). Hugo Weinberger. Discusses the energy in exhaust steam and describes a number of low-pressure turbine plants, with data on their economy. Ills. 4000 w. Zeitschr d Oest Ing u Arch Ver—Jan. 1, 1909. No. 2812 D.

Heating, Water-Heating, Power and Light with Exhaust-Steam Turbines (Heizung, Warmwasserbereitung, Kraftbetrieb und Beleuchtung mit Niederdruck-Dampfturbinen bei Abdampfausnutzung). Herr Tilly. A discussion of the economy of the low-pressure turbine, with costs. Ills. 2200 w. Gesundheits-Ing—Aug. 28, 1909. No. 7983 D.

5,000-KW Exhaust-Steam Turbine in Interborough Powerhouse. Plan and description of the Curtis exhaust-steam turbine recently placed in the 59th Street station, in New York City. 800 w. Elec Wld—Aug. 12, 1909. No. 7012.

Exhaust Steam Turbines. J. W. Kirkland. Explains how the exhaust, or low pressure, steam turbine makes it possible to transform to useful work the available energy of steam in the lower pressure ranges, and electric power produced at less cost. Ills. Discussion. 5000 w. Jour S African Assn of Engineers—Aug., 1909. No. 8333 F.

The French Thomson-Houston Company's Curtis Turbine (Die Curtisturbinen der französischen Thomson-Houston-Gesellschaft, Paris). W. Koeniger. Illustrated detailed description. Serial, 1st part. 1600 w. Zeitschr f d Gesamte Turbinenwesen—March 10, 1909. No. 4270 D.

The Utilization of Exhaust Steam in Collieries. C. B. Chartres. Read before the S. Wales Inst. of Engrs. Its use in low-pressure turbines driving dynamos for supplying electrical energy is discussed. 5000 w. Mech Engr—Sept. 24, 1909. No. 8354 A.

The Utilization of Exhaust Steam in Collieries. C. B. Chartres. Abstract from Pro. of S. Wales Inst. of Engrs. Considers its use in low-pressure turbines for generating electricity. 3000 w. Ir & Coal Trds Rev—Aug. 20, 1909. No. 7447 A.

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Exhaust Steam Turbines. Editorial discussion of the prevailing tendency to use the low pressure turbine as supplemental to non-condensing plants. 1100 w. *Elec Age*—May, 1909. No. 5427.

Low-Pressure Steam Turbines. C. H. Smoot. Compares the Rateau-Smoot with the Parsons and Curtis types. Ills. 7000 w. *Power*—June 22, 1909. No. 5815.

Low Pressure Turbines. F. M. Lege, Jr. Discusses the possibilities of the low-pressure steam turbine when operated by the exhaust steam of an existing reciprocating plant. Abstract of paper before the Southwestern Elect. and Gas Association. 2200 w. *Elec Ry Jour*—June 5, 1909. No. 5254.

Curtis Steam Turbines for Large Power Stations. W. E. Miller. General description and extent of use. Ills. 1300 w. *Elec Age*—May, 1909. No. 5432.

The Curtis Horizontal Steam Turbine. H. E. Twombly. Directions for operating this type. Ills. 2500 w. *Power*—Nov. 10, 1908. No. 165.

Running a Parsons Turbine. H. M. MacSweeney. Suggestions for operation. 2000 w. *Power*—Nov. 24, 1908. No. 470.

The New Eyermann Steam Turbine. Dr. Alfred Gradenwitz. Illustrated description of a turbine showing decided departures from usual practice. 2500 w. *Power*—Nov. 24, 1908. No. 467.

Oerlikon Steam Turbines. Illustrated detailed description of the latest type of these machines. 2200 w. *Elect'n, Lond*—Dec. 4, 1908. No. 1008 A.

The Oerlikon Steam Turbine (Dampf-turbine Oerlikon). Illustrated detailed description. 2200 w. *Die Turbine*—Sept. 5, 1909. No. 8675 D.

Melms-Pfenninger Steam Turbines. Trans. from *Die Turbine*. Ernest N. Jansen. Illustrated description. 1000 w. *Jour Am Soc of Nav Engrs*—Nov., 1908. No. 1891 H.

The Melms-Pfenninger Steam-Turbine. Illustrated detailed description of an attempt to combine the advantages of both the impulse and reaction types of turbine, which seems to be successful. Plate. 2500 w. *Engng*—July 9, 1909. No. 6423 A.

The Bergmann Steam Turbine. Illustrated description with statement of the advantages claimed. 2000 w. *Col Guard*—Feb. 5, 1909. No. 2483 A.

The Bergmann Steam Turbine (Die Bergmann-Dampfturbine). Philipp Reuter. Illustrated detailed description. Serial.

1st part. 1800 w. *Die Turbine*—April 20, 1909. No. 4880 D.

Steam Turbines, with Special Reference to the Zoelly Turbine (Stoomturbines met speciale Vermelding der Zoelly-Stoomturbine). J. Strumphler. Discusses their design and operation. Ills. 6000 w. *De Ingenieur*—Feb. 13, 1909. No. 3573 D.

The Kolb Electra Steam Turbine (Turbines à Vapeur electra, Système Kolb). A. Mauduit. Illustrated detailed description. Serial. 1st part. 2400 w. *Génie Civil*—Feb. 13, 1909. No. 3343 D.

The Design and Performance of the A. E. G. Steam Turbine Plants. Illustrated description. 2000 w. *Elec Rev, Lond*—Sept. 3, 1909. No. 7728 A.

Test of Terry Steam Turbine. C. W. Dyson. Illustrated description with report of tests. 1200 w. *Jour Am Soc of Nav Engrs*—Aug., 1909. No. 8092 H.

A New Impulse Steam Turbine. A 1100 brake horse-power impulse turbine of the multiple-velocity type is illustrated and described. 1800 w. *Engr, Lond*—Sept. 24, 1909. No. 8370 A.

Willans Vacuum Turbine for Use with Exhaust Steam. Illustrated article dealing with the important points of an installation of this steam-turbine. 1800 w. *Elec Engr, Lond*—June 18, 1909. No. 6027 A.

The Attachment of Steam-Turbine Blades (Ueber die Befestigung von Dampfturbinen-schaufeln). Wilhelm Gentsch. Illustrated description of the practice of various makers. Serial. 1st part. 2000 w. *Die Turbine*—Oct. 5, 1908. No. 566 D.

The Turbine with Regenerator as a Heat Motor (Die Turbine mit Regenerator als Wärmemotor). J. Nadrowski. A study of the thermodynamics of the steam turbine. Ills. Serial. 1st part. 2800 w. *Die Turbine*—Oct. 5, 1908. No. 565 D.

Surface Condensation for Steam Turbines. E. Josse. Abstract of paper read before the *Schiffsbautechnische Gesellschaft* at Berlin. Considers the coefficient of heat transference, influence of air leakage, condenser pumps, etc. 3000 w. *Power*—Feb. 2, 1909. No. 2188.

The Steam Turbine for Use with Mixed Loads (Die Dampfturbine in Betrieben mit gemischtem Energiebedarf). A. Dahme. Illustrates and discusses the use of low-pressure turbines in plants where steam is used for a variety of purposes. 2200 w. *Zeitschr f d Gesamte Turbinenwesen*—Feb. 10, 1909. No. 3378 D.

See also Condensers, and Entropy, under STEAM ENGINEERING; Stuffing Boxes.

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Turbine Speed

under MACHINE ELEMENTS AND DESIGN; Turbo-Generators, under ELECTRICAL ENGINEERING, DYNAMOS AND MOTORS; Steam Turbines, under MARINE AND NAVAL ENGINEERING; and Hoisting Engines, under MINING AND METALLURGY, MINING.

Turbine Speed.

See Gears, under MACHINE ELEMENTS AND DESIGN.

Turbine Tests.

Steam Consumption Tests of a 500-kw. Turbo-Generator Set. A. C. Scott. A report of tests and results. Ills. 1200 w. Elec Wid—May 6, 1909. No. 5033.

Tests of a 150-Kilowatt Steam Turbine (Versuche an einer Rateau-Dampfturbine von 150 KW.). Anton Gramberg. Describes the tests and gives the results in curves. Ills. 3500 w. Zeitschr d Ver Deutscher Ing—Feb. 13, 1909. No. 3562 D.

Tests of a 300-Kilowatt Parsons Turbine (Untersuchung einer 300 KW-Parsonsturbine). W. Gensecke. A comprehensive discussion of a very thorough test. Ills. Serial. 1st part. 3000 w. Zeitschr f d Gesamte Turbinenwesen—Feb. 27, 1909. No. 3381 D.

Test of a 4000 k.w. A.E.G. Curtis Turbogenerator in the Rummelsburg Station, Berlin (Untersuchung eines 4000 K W. A.E.G.-Turbogenerators in der Zentrale Rummelsburg der Berliner Elektrizitätswerke, Berlin). Describes the test and gives the results. Ills. 2000 w. Zeitschr f d Gesamte Turbinenwesen—May 19, 1909. No. 5779 D.

See also Power-Plant Testing, under POWER AND TRANSMISSION.

Turning Engines.

See Engine Designs, under STEAM ENGINEERING.

Valve Gears.

Setting the Valves of a Russell Engine. Hubert E. Collins. A study of valve movement of four-valve engine with Meyer cutoff and separate exhaust valves of rotative type. Ills. 3500 w. Power—Dec. 1, 1908. No. 721.

Setting the Valves of the Cummer Engine. H. E. Collins and J. H. Francis. An illustrated study of valve movement, with directions for overhauling and valve setting. 3000 w. Power—Jan. 26, 1909. No. 2087.

Marine Engine Valves and Valve Passages. Albert H. Ziegler. Discusses their

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Water Hammer

design in detail. Ills. 5500 w. Rudder—March, 1909. No. 3128 D.

Reversing Valve Gears in General Use. Simpson Rice. An illustrated review of the types which have stood the test of continuous or intermittent operation, and a study of their characteristics. 4500 w. Power—May 11, 1909. No. 4584.

Grunewald's Apparatus for Reversible Compound Engines. An invention designed to shorten the starting and stopping of reversible compound engines. Ills. 400 w. Ir & Coal Trds Rev—May 28, 1909. No. 5412 A.

Valves.

Locating and Adjusting Valves. W. H. Wakeman. Remarks concerning gate valves and other types. 1200 w. Power—Dec. 22, 1908. No. 1082.

The Use and Abuse of Globe Valves. W. H. Wakeman. Illustrates and describes the principal features of the different types. 2500 w. Power—Jan. 5, 1909. (Special No.) No. 1479 D.

Gate Valves in Steam Pipe Lines. W. H. Wakeman. Practical suggestions for locating and using them. 2000 w. Power—Feb. 16, 1909. No. 2500.

Types of Check Valve and Their Operation. W. H. Wakeman. Illustrates and describes the construction and operation of various types. 5000 w. Power—July 6, 1909. No. 6201.

A New Type of Steam Regulator Valve. Illustrated description of the Servo steam regulator valve. 1000 w. Engr, Lond—Oct. 8, 1909. No. 8944 A.

Misuse of Pressure Reducing and Regulating Valves in Steam Service. A. W. Cash. Discusses the use and misuse of valves, illustrating by examples. 2000 w. Heat & Vent Mag—Oct., 1909. No. 8755.

Water Hammer.

Water Hammer Action in Steam Pipes. Describes Mr. C. E. Stromeyer's experimental apparatus for studying water-hammer, and reviews his method of calculating stresses. Ills. 2500 w. Locomotive—July, 1909. No. 7507.

Water Hammer. From the memorandum of the Chief Engineer to the Manchester Steam Users' Assn., explaining the danger and giving the solution of water hammer blows and the conditions that may cause explosions. 3000 w. Prac Engr—Jan. 15, 1909. Serial, 1st part. No. 2053 A.

See also Steam Pipes, under STEAM ENGINEERING.

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TRANSPORTING AND CONVEYING

Aerial Tramways

Aerial Tramways.

Electrically Operated Aerial Tramways and their Applications (*Die Elektrohängebahnen und ihre Verwendung*). C. Claus. Illustrated description of various types and various applications. 2000 w. *Elek Kraft u Bahnen*—Dec. 14, 1908. No. 1991 D.

Recent Progress in the Construction of Aerial Tramways (*Recenti Progressi sulla Costruzione di Ferrovie Aeree*). Describes a number of recent installations. Ills. Serial, 1st part. 2000 w. *Ing Ferro*—July 1, 1909. No. 7247 D.

Electric Suspension Railways (*Ueber Elektrohängebahnen*). M. Freyberg. Illustrates and describes a number of aerial-tramway installations for coal and ore handling. 2000 w. *Glückauf*—Aug. 21, 1908. No. 7964 D.

Aerial Tramway for a Harz Lime Works. Illustrated description of an aerial tramway with a capacity of 75 tons per hour designed to withstand winter weather. 2000 w. *Indus Engng*—Oct. 15, 1909. No. 8576 B.

Electrical Suspension Railways in Foundries (*Elektrische Hängebahnen in Giessereien*). Otto S. Schmidt. Describes a number of recent installations. Ills. 2700 w. *Stahl u Eisen*—Sept. 8, 1909. No. 8652 D.

Automatic Feeders.

Automatic Feeders for Handling Material in Bulk. C. Kemble Baldwin. Illustrated description of the various types now in use. 1600 w. *Jour Am Soc of Mech Engrs*—May, 1909. No. 4408 F.

Auto Trucks.

Application of the Storage Battery to Auto Trucks. Illustrated detailed description of the system in use in the Westinghouse machine shops, Pittsburg. 1800 w. *Ir Trd Rev*—Dec. 3, 1908. No. 791.

Bucket Elevators.

Mechanical Elevator. T. A. Rickard. Illustrates and describes a machine devised for conditions in Alaska, in handling the gravel deposits by either the hydraulic or dredging methods. 1600 w. *Min & Sci Pr*—March 20, 1909. No. 3505.

Cableways.

Short-Distance Transportation. Frank C. Perkins. Illustrated description of a modern freight conveying system. 1000 w.

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Sci Am Sup—Nov. 21, 1908. No. 334.

Aerial Tramway for Coal Transportation. Robert M. Magraw. Illustrated description of plant at Electric, Mont. 3800 w. *Mines & Min*—July, 1909. No. 6178 C.

The Employment of Suspension Railways in Ironworks. Illustrates and describes applications showing the adaptability of this system. 1500 w. *Engr*, Lond—Dec. 18, 1908. No. 1377 A.

A Travelling Cableway. An interesting cableway recently erected at Grays, in Essex, is illustrated and described. 600 w. *Engr*, Lond—Feb. 12, 1909. No. 2704 A.

The Transport and Dumping of Material. Illustrated description of recently built plants of the Bleichert ropeway system. 800 w. *Col Guard*—Aug. 27, 1909. No. 7649 A.

Cableways (*Les Transports aériens sur Cables*). P. Piérart. Describes the construction of various systems, uses of aerial tramways and notable examples. Ills. Serial, 1st part. 3500 w. *All Indus*—July 1909. No. 7224 D.

Cableway Chariots (*Die Klemmapparate der Drahtseilbahnen*). A. Pietrowski. A historical and critical review of various types. Ills. 3500 w. *Stahl u Eisen*—Nov. 18, 1908. No. 1144 D.

The Electric Aerial Mono-Rail Up the Wetterhorn. Illustrated detailed description of an aerial railway in Switzerland, operated on the "compensating" system, and taking passengers to a height of some 5250 feet above sea level. 1500 w. *Sci Am*—May 8, 1909. No. 4540.

The Wetterhorn Cable Road of the Grindelwald Glacier, Switzerland. Frank Koester. Illustrated description of an installation of the Feldmann cable system, carrying tourists to a vertical height of 1377 feet. 1500 w. *Elec Rev*, N Y—July 10, 1909. No. 6210.

The Wetterhorn Cableway Incline. Illustrated description of this interesting cableway in Switzerland, and its operation. 1500 w. *Eng News*—July 22, 1909. No. 6616.

The Wetterhorn Cableway (*L'Ascensore del Wetterhorn*). Detailed description of the driving machinery. Ills. Serial. 1st part. 1600 w. *Monit Tech*—May 30, 1909. No. 5744 D.

The Wetterhorn Cableway at Grindelwald, Switzerland (*Le Funiculaire du Wetterhorn à Grindelwald, Suisse*). Illustrated description of a long span rope-

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way up the side of the Wetterhorn. Plate. *Génie Civil*—Feb. 13, 1909. No. 3340 D.

The Wetterhorn Cable Way (Der Wetterhornaufzug I Sektion). Illustrated description of the first section of a steeply inclined cable hoist on the slope of this mountain in Switzerland. Serial, 1st part. 2500 w. *Schweiz Bau*—Dec. 12, 1908. No. 1955 B.

Passenger Cableway Carrier at Mt. Ulia, Spain. Illustrated description of a cableway connecting two mountain resorts. 600 w. *Eng News*—July 22, 1909. No. 6617.

A Passenger Ropeway at Mount Ulia, near Saint Sebastian, Spain (Le Transbordeur funiculaire à Voyageurs du Mont Ulia, près de Saint-Sébastien, Espagne). G. Espitallier. Brief illustrated description. 2000 w. *Génie Civil*—June 5, 1909. No. 6545 D.

The World's Most Remarkable Aerial Tramway. Abstract translation from *Zeit. des Ver. Deut. Ing.* Illustrated detailed description of a line in Argentine Republic. It is 22 miles long and has a total ascent of 11,800 feet. 5500 w. *Ind Engng*—Aug. 15, 1909. No. 7176 C.

A Bleichert Tramway in the Argentine Cordilleras (Les Cordillères du Nord de l'Argentine rendues accessibles par une Voie aérienne du Système Bleichert). J. E. Giraud. Illustrated description of the Chilecito installation. 2000 w. *Rev de Métal*—March, 1909. No. 4214 E + F.

An Ore-transplanting Railway in the Pyrenees. A. Gradenwitz. Describes a loading and terminal wire rope tramway connected by a local railway used to transport iron ore from Mt. Canigou to Amelie-les-Bains. Ills. 950 w. *Eng & Min Jour*—June 5, 1909. No. 5292.

Automatic Aerial Wire Ropeway at Stanton Iron Works. Illustrated description. 400 w. *Ir & Coal Trds Rev*—Oct. 8, 1909. No. 8958 A.

A Dock Cableway at the Reiherstieg Shipbuilding and Machine Works, Hamburg (Die Hellingseilbahnanlage der Reiherstieg-Schiffswerft und Maschinenfabrik in Hamburg). Anton Böttcher. Illustrated description of a unique dock installation. 4000 w. *Zeitschr d Ver Deutscher Ing*—Nov. 14, 1908. No. 1191 D.

See also Construction, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS.

Car Dumping.

Unloading Railroad Cars by Machinery. Snowden B. Redfield. Illustrated description of the McMyler car dumper

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at the Hoboken docks of the D., L. & W. R. R. Co., and its operation. 2200 w. *Am Mach*—Vol. 32. No. 33. No. 7163.

Electrically Operated Coal Car-Dumping Plant at the Rothesay Dock, near Glasgow (Elektrisch betriebene Kohlenkipperanlage am Rothesay-Dock bei Glasgow). W. Schlachter. Illustrated description. Serial, 1st part. 5000 w. *Zeitschr d Ver Deutscher Ing*—Aug. 7, 1909. No. 7998 D.

See also Coal Handling, and Freight Handling, under TRANSPORTING AND CONVEYING.

Coal Handling.

Recent Developments in Conveying Machinery for Coal and Ashes. Wilbur G. Hudson. A discussion of the mechanical features and cost-saving of coal-handling machinery. Ills. 2500 w. *Engineering Magazine*—July, 1909. Serial, 1st part. No. 5977 B.

Recent Developments in Conveying Machinery for Coal and Ashes. Wilbur G. Hudson. Second instalment of a discussion. Considers storage facilities, automatic weighing and ashes handling. Ills. 2500 w. *Engineering Magazine*—Aug, 1909. No. 6751 B.

Handling Coal by Electric Shovels. Edgar H. Wattington. Illustrates and describes the use of electric motors for crane driving. 1200 w. *Ir Age*—Jan. 14, 1909. No. 1747.

Handling Coal by Electric Shovels. Edgar H. Wallington. Illustrates and describes electric cranes of different types. 1200 w. *Sib Jour of Engng*—Dec., 1908. No. 1350 C.

The Virginian Railway's Coal Handling Plant. Illustrated description of the coal shipping terminal at Sewell's Point, Va. 1200 w. *Ir Age*—July 22, 1909. No. 6601.

Coaling Station at Guantanamo, Cuba. W. P. Engelman. Illustrated description of this modern high speed coaling station and its equipment. 1100 w. *Ir Age*—June 24, 1909. No. 5857.

Electric Suspension Railways for Handling Coal and Coke. F. A. Talbot. Illustrates and describes plants recently erected in Germany. 1700 w. *Elec Wld*—Feb. 25, 1909. No. 2869.

English Practice in Coal Handling Plants. James A. Seager. General outline of methods employed in Great Britain, with illustrated descriptions of certain devices. 3000 w. *Power*—Dec. 29, 1908. No. 1314.

Coal Shipping Arrangements at St. John's Collieries, Normanton. Illustrated

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description of arrangements for loading coal into boats at a colliery nearly two miles from a canal wharf. 2500 w. *Ir & Coal Trds Rev*—Jan. 29, 1909. No. 2372 A.

Hydraulic Coal-Handling Equipment at the Garston Docks. Illustrated detailed description. 4000 w. *Ir & Coal Trds Rev*—May 14, 1909. No. 5140 A.

An Interesting German Coal Loading Installation. Illustrated description of a travelling crane installed in Emden harbor. 1200 w. *Col Guard*—Feb. 5, 1909. No. 2434 A.

Loading and Conveying Plants in German Gas Works. Illustrates and describes various plants. 3000 w. *Sci Am Sup*—Jan. 16, 1909. No. 1781.

Bulk Handling of Coal at the Anhalt Mines (*Massenbeförderung von Kohle auf den Gruben der Anhaltischen Kohlenwerke*). E. Ullmann. Illustrates and describes bins, cars, electric locomotives, etc. Ills. 3500 w. *Zeitschr d Ver Deutscher Ing*—July 17, 1909. No. 7473 D.

Coal and Ore Loading Plants, New Rhine Harbor. J. B. Van Brussel. Illustrated description of a German plant comprising six swing, two double jib, and two bridge cranes. 1200 w. *Eng & Min Jour*—Oct. 16, 1909. No. 8719.

Modern Coal Storage and Reloading Plants in Upper Silesia (*Einige moderne Haldensturz- und Wiederverladeeinrichtungen auf oberschlesischen Steinkohlen-gruben*). Herr Nahnsen. Describes a number of notable installations. 6200 w. Ills. Glückauf—Sept. 18, 1909. No. 8664 D.

Coal Handling in Docks (*Grundzüge für die Kohlenverladung beim Schiffsumschlag*). Herr Berkenkamp. Illustrated description of various methods and devices. Serial, 1st part. 3500 w. Glückauf—Dec. 12, 1908. No. 1953 D.

New Coal and Ore Loading Plant at Schweigern. Illustrates and describes an extensive plant. 1500 w. *Ir & Coal Trds Rev*—March 5, 1909. No. 3178 A.

Storage Yard and Mechanical Handling and Loading Plant at the Rheinelbe III Mine (*Lagerplatz und Vorrichtung zum mechanischen Stürzen und Rückladen von Kohlen auf der Schachanlage Rheinelbe III*). Wilhelm Schulte. Illustrated description. 3100 w. Glückauf—Oct. 17, 1908. No. 555 D.

Coal-Loading Plant for Japan. Illustrates and describes a novel plant for loading a ship with coal, at the rate of 500 tons per hour. 700 w. *Col Guard*—Dec. 18, 1908. No. 1367 A.

Recent Progress in Plants for the Rapid Loading and Unloading of Railway Cars (*Recenti Progressi negli impianti per il Carico e lo Scarico accelerato dei Carri ferroviari*). Giulio Pasquali. Describes recent plants for loading and dumping coal cars. Ills. 3000 w. *Ing Ferro*—Aug. 1, 1909. No. 7946 D.

See also Mechanical Stokers, under STEAM ENGINEERING; Coal Pockets, under CIVIL ENGINEERING, CONSTRUCTION; Docks, under CIVIL ENGINEERING, WATERWAYS AND HARBORS; Steamships, under MARINE AND NAVAL ENGINEERING; and Mine Conveyors, under MINING AND METALLURGY, COAL AND COKE.

Conveyors.

The Use and Performance of Belt Conveyors. Werner Boecklin. A useful summary of general working principles tending to economical operation. Ills. 2500 w. *Engineering Magazine*—Dec., 1908. No. 676 B.

Belt Conveyors for Handling Materials. George Frederick Zimmer. Illustrates and describes this method of handling and distributing materials. 3000 w. *Cassier's Mag*—Aug., 1909. No. 7037 B.

The Conveying of Materials. The Belt Conveyor. C. Kemble Baldwin. Abstract of paper with the author's reply to discussion. 3500 w. *Jour Am Soc of Mech Engrs*—Jan., 1909. No. 1853 F.

The Belt Conveyor in Railway Building. C. Kemble Baldwin. Describes adaptation of belt conveyors to this class of service. 2500 w. *R R Age Gaz*—March 26, 1909. No. 3519.

A Novel Belt Conveyor System. Illustrated description of the system used in concrete construction on the New York Barge Canal. 2000 w. *Ir Age*—Nov. 5, 1908. No. 86.

A Unique Belt Conveyor. E. C. Soper. Description of a belt conveyor a quarter of a mile long, requiring more power to and illustrations. 1000 w. *Jour Am Soc operate empty than loaded*. Line drawings of Mech Engrs—May, 1909. No. 4415 F.

Labor Saving Devices in Industries. G. A. Julius. Abstract of paper read before the Engng Assn. of N. S. W. A review of ancient and modern appliances for the handling and transport of materials. 3000 w. *Aust Min Stand*—June 16, & 23, 1909. Serial, 2 parts. No. 6862 each B.

Recent Developments in Material Handling Devices (*Ueber einige Neuerungen im Massentransport*). M. Buhle. Describes

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recent European types of conveyors, bucket elevators, etc. Ills. Serial, 1st part. 2500 w. Zeitschr d Oest Ing u Arch Ver—Oct. 23, 1908. No. 582 D.

Handling Crushed Rock on San Francisco Bay. F. K. Blue. Illustrated description of the belt conveyors and bucket elevators which convey the material to and from bins and load and discharge the hopper barges. 1500 w. Eng & Min Jour—Dec. 12, 1908. No. 965.

A Notable Conveyor Installation. Illustrated description of the link-belt equipment in the Champion Fiber Company's works. 1800 w. Ir Age—March 4, 1909. No. 2931.

Vacuum Ash Conveyor at Armour Glue Works. George B. Hess. Illustrated description of an installation handling 7 tons per hour, at cost of 7 cents per ton. 2500 w. Power—June 15, 1909. No. 5496.

Transport of Filling-Up Material by the Harpener Bergbau-Gesellschaft, near Dartmund, Germany. Description of the conveying equipment. 1500 w. Min Jour—Aug. 28, 1909. No. 7642 A.

New Devices for the Handling of Materials in Horizontal and Slightly Inclined Planes (Neuere Hilfsmittel für den Massentransport in horizontaler und leicht geneigter Ebene). Hubert Hermanns. Describes a number of portable and stationary conveyors. Ills. 2500 w. Stahl u Eisen—Sept. 1, 1909. No. 8649 D.

See also Steamships, under MARINE AND NAVAL ENGINEERING; Ore Handling, under TRANSPORTING AND CONVEYING; and Weight, under MEASUREMENT.

Cranes.

Early Steam Cranes and Hoists. Fully illustrated history of the early development of fixed and locomotive steam cranes. Shows the more important types before 1870. 4000 w. Engr, Lond—May 28, 1909. No. 5267 A.

Giant Cranes. Harold P. Hobart. Reviews the past and present types of these machines in the great seaports. 1500 w. Yale Sci M—April, 1909. No. 4374 C.

Comparison of Large Power Fixed and Floating Cranes. Illustrates and describes types of floating cranes, showing their usefulness, especially in shipbuilding, and their advantage in cost. 1200 w. Engr, Lond—April 9, 1909. No. 4042 A.

Calculation of Pillar Cranes. Charles A. Schranz. A study of the stresses in the boom and in the pillar and tie-bars, vertical tie-rods, foundation bolts, etc. 1500 w. Mach, N Y—Sept., 1909. No. 7499 C.

TRANSPORTING AND CONVEYING

Cranes

Temperley Transporters. An illustrated article dealing with the various designs and the conditions they had to meet. 5000 w. Engng—Jan. 8, 1909. Serial, 1st part. Plate. No. 1819 A.

Design and Construction of Electric Overhead Cranes. R. B. Brown. A record of present practice in electrically-operated overhead cranes, with facts of value to designers. 2000 w. Mach, N Y—Jan., 1909. Serial, 1st part. No. 1549 C.

The Electric Traveling Crane. Walter G. Stephan. An illustrated discussion of the principles governing the design. 6500 w. Ir Trd Rev—Jan. 7, 1909. No. 1608.

The Electrical Equipment of Cranes. John Brentnall Duckitt. A discussion of present practice and of the advantages claimed. Gen. discussion. 6 plates. 9000 w. Trans N-E Coast Inst of Engrs & Shipbldr—Feb., 1909. Serial, 1st part. No. 3807 N.

Four-Motor Overhead Electric Traveling Crane. Illustrations, with brief description of a crane built in Liverpool. 400 w. Engng—Sept. 24, 1909. No. 8364 A.

Tower Cranes and Transporters. Illustrated description of electrically-driven cranes for a large shipbuilding firm in Holland. 700 w. Engr, Lond—April 23, 1909. No. 4471 A.

Electric Travelling Gantry Crane. Illustrations with brief description. 500 w. Engng—June 18, 1909. No. 6041 A.

150-Ton Electric Shipbuilding Crane. Illustrated description of a crane recently completed at the Wallsend shipbuilding yard. 2000 w. Engr, Lond—Aug. 20, 1909. No. 7486 A.

An Electric Bridge Crane for Handling Ingots (Elektrisch betriebener Bockkran für die Verladung von Ingots). R. Dub. Illustrated detailed description. 2200 w. Zeitschr d Ver Deutscher Ing—Jan. 16, 1909. No. 2837 D.

Building Slip Equipments. H. H. Broughton. Deals with the essentials in the crane equipment of a building slip. Ills. 2000 w. Elect'n, Lond—Aug. 27, 1909. No. 7645 A.

The Construction Plant for the Pacific Locks of the Panama Canal. Illustrated description of cantilever cranes. 1200 w. Eng Rec—Dec. 19, 1908. No. 1057.

Traveling Cranes for Building Concrete Lock Walls at Brownsville. Outlines the work in progress, especially describing the huge gantry cranes, running on a trackway supported on pile trestles, which has proved its efficiency. Ills. 2500 w. Eng Rec—Feb. 27, 1909. No. 2845.

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Modern Handling Cranes Built by Adolf Bleichert & Co., Leipzig (Moderne Verladekrane gebaut von Adolf Bleichert & Co. in Leipzig-Gohlis). Georg von Hanffstengel. Illustrated description. Serial. 1st part. 3800 w. Zeitschr d Ver Deutscher Ing—Oct. 31, 1908. No. 608 D.

Revolving Cantilever Crane Built by the Benrath Machine Co. (Turmdrehkran, gebaut von der Benrath Maschinenfabrik A.-G.). F. Heym. Illustrated description of a large crane recently installed in St. Nazaire harbor. 1600 w. Zeitschr d Ver Deutscher Ing—July 24, 1909. No. 7475 D.

150-Ton Swinging-Jib Cranes (Grues flottantes de 150-Tonnes, à Volée basculante). F. Hofer. Describes three types. Ills. 2000 w. Génie Civil—Aug. 28, 1909. No. 7939 D.

75-Ton Steam Floating Crane for Montreal. Illustrated detailed description. 1000 w. Engng—Sept. 17, 1909. No. 8124 A.

Notes on Shafting for Cranes. E. G. Fiegehen. An illustrated discussion of details in the design of a shaft for a given service. 2000 w. Mech Wid—April 30, 1909. Serial. 1st part. No. 4608 A.

See also Shop Appliances, under MACHINE WORKS AND FOUNDRIES; • Coal Handling, under TRANSPORTING AND CONVEYING; and Floating Cranes, and Shipbuilding, under MARINE AND NAVAL ENGINEERING.

Crane Trolleys.

Electrically Operated Crane Trolleys (Motorlaufwinden). C. Michenfelder. Illustrates and describes several types of electric-crane trolleys and hoists. Serial, 1st part. 1200 w. Elektrotech Rundschau—Feb. 10, 1909. No. 3555 D.

Derricks.

Steel Derricks for Erecting Tall Buildings. Illustrated description of derricks used in New York City. 1200 w. Eng Rec—March 27, 1909. No. 3538.

A Fifty-Ton Movable Stiff-Leg Derrick. Description of steel erection derrick used on heavy plate-girder work of a railway viaduct by N. Y., N. H. & H. R. R., at Providence. Ills. 1400 w. Eng Rec—June 5, 1909. No. 5279.

Dock Machinery.

Electrically-Driven Machinery at Fish-guard Harbor. Illustrated detailed description of the harbor machinery installed. 3500 w. Elect'n, Lond—Sept. 24, 1909. No. 8346 A.

TRANSPORTING AND CONVEYING

Elevators

Eleventh International Navigation Congress, St. Petersburg, 1908 (XI^e Congrès international de Navigation tenu à Saint-Petersbourg en 1908). Report of the discussion on dock machinery for ports handling inland traffic, particularly the progress of electrical control of dock and harbor machinery. 4800 w. Ann d Ponts et Chaussées—1909-IV. No. 7914 E + F.

See also Cableways, under TRANSPORTING AND CONVEYING.

Elevator Accidents.

The Hydraulic Lift Accident on the City and South London Railway. Board of Trade report of an inquiry into the circumstances of the accident on Aug. 2, at the Oval Station. 3000 w. Mech Engr—Sept. 24, 1909. No. 8353 A.

Elevators.

The Operation of Passenger Elevators. Reginald Pelham Bolton. A study of conditions of operation and the effect on service. 3000 w. Pro Am Soc of Civ Engrs—Dec., 1908. No. 1354 E.

The Traction Elevators in the Singer Building, New York. Illustrated detailed description of the operating principle of the high-rise machines for this building which exceeds 600 ft. in height. 4000 w. Eng Rec—May 1, 1909. No. 4395.

The Safety Equipment of the Singer Building Elevators. Illustrates and describes the precautions taken for the protection of passengers from overspeed of travel and possibility of the car falling. 3000 w. Eng Rec—Sept. 11, 1909. No. 7674.

Design of a Short-run Plunger Elevator. C. R. Harris. Illustrated detailed description of the building and installing of such an elevator. 2000 w. Am Mach—Vol. 31. No. 53. No. 1401.

Design of a Balanced Plunger Elevator. C. R. Harris. Gives details for the design, building and installation of such an elevator. Ills. 1500 w. Am Mach—Vol. 32. No. 3. No. 1865.

Belted Electric Elevators. William Baxter, Jr. Describes the principal methods of operation and some features of construction. Ills. 2500 w. Power—Aug. 17, 1909. No. 7111.

Electric Lift-Control Gear. Illustrated description of a form of lift control gear for direct-current working. 1600 w. Engng—Aug. 27, 1909. No. 7653 A.

Power Requirements of Hydraulic and Electric Elevators (Arbeitsverbrauch eines hydraulisch und eines elektrisch betriebenen Personenaufzuges.) Herr Mühl-

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Freight Handling

mann. The results of comparative tests are given. Ills. Serial. 1st part. 2500 w. Elek Kraft u Bahnen—March 4, 1909. No. 4804 D.

Freight Handling.

The Handling of Railway Freight in Bulk (Die Verladung von Massengütern im Eisenbahnbetrieb). Prof. Aumund. The serial begins with a review of car-dumping devices. Ills. Serial. 1st part. 4500 w. Zeitschr d Ver Deutscher Ing—Sept. 4, 1909. No. 8908 D.

Grain Handling.

The Mitchell Cantilever Grain-Elevator. Illustrated detailed description of an elevator designed for discharging grain from ships to barges. 1600 w. Engng—July 9, 1909. No. 6424 A.

Grain-Conveying Machinery at Avonmouth Dock. Illustrated description of a recent installation at the Royal Edward dock, Bristol. 1200 w. Engr, Lond—Sept. 24, 1909. No. 8371 A.

See also Grain Elevators, under CIVIL ENGINEERING, CONSTRUCTION.

Hoists.

The Electric Hoist and Its Applications. Clifford F. Hutchings. Describes the construction and uses. Ills. 1200 w. Ind Engng—July 15, 1909. No. 6677 C.

Ice Handling.

Ice-Handling Machinery in Ice-Manufacturing Plants. Frank H. Abbey. Illustrates and describes methods and machines. 3000 w. Ice & Refrig—Dec., 1908. No. 997 C.

Industrial Railways.

A Successful Investment in an Industrial Railway. John M. Bruce. Illustrated description of a plant in Newark, N. J., for handling gypsum from steamer to storage yard. 1500 w. Engng-Con—Nov. 25, 1908. No. 714.

Novel Industrial Railroad Installation. John M. Bruce. Illustrated description of the installation at the Cambridgeport plant of the Boston Woven Hose & Rubber Co. 1600 w. Ir Age—Jan. 14, 1909. No. 1748.

Narrow-Gauge Railway for a Gas-Works. Illustrated detailed description of the recently completed line connecting Harrogate with the Northeastern Ry. Co.'s lines at Bilton. 1200 w. Engr, Lond—Nov. 20, 1908. No. 744 A.

Miniature Railroads for Country Transportation. Illustrated description of the Blakesley Hall miniature railroad and

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other lines on English estates. 1200 w. Sci Am—Jan. 2, 1909. No. 1429.

Jacks.

Tests of a Six-Ton Jack. G. A. Glick. Brief report of test to obtain the efficiency. 400 w. Power—April 13, 1909. No. 3922.

Lifting Magnets.

The Industrial Use of the Lifting Magnet. W. Frank M'Clure. Information in regard to the uses to which these magnets are applied, new types, and their operation. Ills. 1500 w. Sci Am—Feb. 6, 1909. No. 2280.

Electric Lift Magnets. Lawrence Whittridge Cady. Brief discussion of their uses, care needed and related subjects. 1000 w. Elec Wld—Aug. 5, 1909. No. 6903.

Material Handling.

Modern Material-Handling Machinery for Industrial Plants. A. G. A. Schmidt. The present article illustrates and describes types of hoisting machinery. 6000 w. Ind Engng—April, 1909. Serial, 1st part. No. 4077 C.

See also Shops, under MACHINE WORKS AND FOUNDRIES.

Ore Handling.

Ore Handling on the Atlantic Coast. H. Penton. An illustrated article describing the improved modern equipment displacing the older methods. 2200 w. Ir Trd Rev—Oct. 7, 1909. No. 8408.

Ore Handling on the Atlantic Coast. An illustrated article, describing old methods and the improved modern equipment that is displacing them. 2000 w. Marine Rev—Oct., 1909. No. 8549.

Ore-Handling Machinery at the N. Y. P. & O. Dock at Cleveland, Ohio. Harry E. Scott. Illustrated detailed description of the plant near the foot of W. 25th St., the electrical unloaders, their operation, speed, etc. 4000 w. Jour Worcester Poly Inst—Jan., 1909. No. 1841 C.

The Ore-Handling Plant of the Steel Works at Gary, Indiana. Illustrated detailed description of the equipment, as an example of the best American practice. 3000 w. Eng Rec—Jan. 2, 1909. No. 1419.

Handling Ore at Copper Queen Mines, Bisbee. Walter Gardner. Includes electric haulage underground, and the transfer to railroad cars by means of belt conveyors. Ills. 1200 w. Eng & Min Jour—March 13, 1909. No. 3117.

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Ore Handling

An Ore Handling Plant in New Caledonia. Illustrates and describes a system of suspension trucks and cables for carrying ore, coal, merchandise and passengers. 4500 w. Eng & Min Jour—Feb. 20, 1909. No. 2556.

Ore-Hoisting Appliances at the Wharf of the Tyce Copper Co., at Ladysmith, Vancouver Island, B. C. E. Jacobs. Illustrated description of the bunkers and conveyers. 800 w. Mines & Min—June, 1909. No. 5242 C.

Shipping Iron Ore at Aquilas, Spain. (Abridged.) Gustave Gillman. Illustrates and describes the arrangements for loading and storing. 2500 w. Inst of Civ Engrs—No. 3716. No. 3204 N.

Recent Ore-Handling Plants at Iron Works (Einige neuere Beförderungsanlagen auf Hochofenwerken). Describes aerial tramway and cableway installations. 3500 w. Stahl u Eisen—Dec. 2, 1908. No. 1940 D.

See also Coal Handling, under TRANSPORTING AND CONVEYING; Docks, under CIVIL ENGINEERING, WATERWAYS AND HARBORS; Steamships, under MARINE AND NAVAL ENGINEERING; and Ore Bins, and Ore Handling, under MINING AND METALLURGY, MINING.

Pulley Blocks.

See Erection, under CIVIL ENGINEERING, BRIDGES.

Rotary Conveyors.

A Novel Type of Rotary Conveyor. Illustrated description of a type of trans-

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porter devised by an English engineer, A. R. Grossmith, for carrying top soil from the excavation site to the dump. 1500 w. Sci Am—Aug. 7, 1909. No. 6959.

Transporter Bridges.

The Old Bizerte Transporter Bridge at the Brest Arsenal (Transport de l'Ancien Pont à Transbordeur de Bizerte dans l'Arsenal Maritime de Brest). G. Leinekugel Le Cocq. Illustrated description. 3500 w. Génie Civil—Oct. 31, 1908. No. 536 D.

Transporters.

Electric Overhead Rack-Rail Transporter for Handling Meat. Illustrated description of Royce transporters for a plant at Buenos Aires, South America. 600 w. Sci Am Sup—July 24, 1909. No. 6623.

The Barry Transporter. Illustrated description of the present form of this transporter, calling attention to improvements introduced. 2500 w. Engng—March 5, 1909. No. 3166 A.

A Novel Type of Transporter. Illustrated description of a conveyor of new design. 1000 w. Engr, Lond—June 18, 1909. No. 6051 A.

See also Cleaning, under MACHINE WORKS AND FOUNDRIES.

Traveling Bridges.

A Large Material Handling Plant. Brief illustrated description of the use of traveling bridges in building a river lock. 1000 w. Ir Age—Nov. 19, 1908. No. 336.

MISCELLANY

Aeronautics.

The Development of Aerial Navigation. Henry Harrison Suplee. An interesting illustrated review of the recent successes with flying machines. 6000 w. Cassier's Mag—April, 1909. No. 3634 B.

The Problem of Aerial Navigation. B. Baden-Powell. A reply to Prof. Simon Newcomb's paper in the September issue of the same magazine. 4000 w. Nineteenth Cent—Nov., 1908. No. 289 D.

Progress in Aviation. G. H. Bryan. A review of progress. Ills. 4000 w. Nature—Oct. 29, 1908. No. 166 A.

Mechanical Flight. Herbert Chatley. Indicates points in which improvement is desired, reviewing prevailing types. Ills. 4500 w. Soc of Engrs—Dec. 7, 1908. No. 1339 N.

Mechanical Flight. Eric Stuart Bruce. Reviews the work of different experimenters in this field, recent achievements, and related matters. General discussion. 9000 w. Jour Soc of Arts—Dec. 4, 1908. No. 998 A.

The Conquest of the Air. J. F. Springer. An illustrated historical review of what has been accomplished. 4500 w. Ir Age—Jan. 7, 1909. No. 1500.

Mechanical Flight. Reviews the developments of the past year. Ills. 2200 w. Engr, Lond—Jan. 1, 1909. No. 1719 A.

Aeronauts and the Law of Trespass. Considers points in connection with this subject. 2000 w. Engng—June 11, 1909. No. 5661 A.

Aviation (Aviation). Gérard Lavergne. The first article gives a review of early

attempts to build flying machines. Serial. 1st part. 1500 w. Rev Indus—April 17, 1909. No. 4829 D.

Aviation (Etat actuel de l'Aviation). M. Taris. A review of the theory of mechanical flight, its history and present state. Ills. 6500 w. Ann d Ponts et Chaussées—1909-II. No. 5713 E + F.

Modern Aeronautics (Ueber moderne Flugtechnik). Artur Boltzmann. An illustrated review of aeronautic theory and achievements. Serial, 1st part. 2000 w. Zeitschr d Oest Ing u Arch Ver—Feb. 5, 1909. No. 3397 D.

Progress in the Construction of Flying Machines (Fortschritte in der Konstruktion dynamischer Flugapparate). Ansbert Vorreiter. A review of the more recent aeroplanes. Ills. 2200 w. Zeitschr d Mit Motorwagen-Ver—Feb. 28, 1909. No. 3392 D.

Lectures on Aviation (Conférences sur l'Aviation). M. Renard. The first discusses aerodynamics, the resistance of the air and its influence on aviation problems, etc. Serial, 1st part. 6300 w. Bul Soc d'Encour—Jan., 1909. No. 3310 G.

The Present and Future of Aviation (Etat actuel et Avenir de l'Aviation). Rodolphe Soreau. An exhaustive paper on the theory, design, construction, and future of aeroplanes. 8000 w. Mem Soc Ing Civ de France—July, 1908. No. 2687 G.

Discussion on Aviation (Note complémentaire à la Discussion sur l'Aviation; Note relative à la Discussion sur l'Aviation). M. Armengaud and Rodolphe Soreau. A criticism of M. Soreau's paper and his reply. Ills. 8000 w. Mem Soc Ing Civ de France—Aug., 1909. No. 7907 G.

Recent Progress in Aviation (Les Progrès récents de l'Aviation). G. Espitalier. Reviews the work of Wright, Farman and Blériot. Ills. Serial. 1st part. 2800 w. Génie Civil—Nov. 21, 1908. No. 1123 D.

Aeroplane Design and Construction. Discusses types, frames, systems of control, etc. Ills. 3500 w. Auto Jour—Jan. 2, 1909. No. 1686 A.

The Laws of Flight. F. W. Lanchester. Read before the British Assn., at Dublin. Considers information obtained by observation and experiment, explaining the theory of flight developed by the author. 3000 w. Engr, Lond—Sept. 18, 1908. Serial. 1st part. No. 95414 A.

Fundamental Principles in the Design of Aeroplanes (Grundzüge für den Bau

des Drachenfliegers). Josef Hofmann. An exhaustive discussion. Ills. Plates. Serial. 1st part. 5500 w. Oest Wochenschr f d Oeff Baudienst—Nov. 21, 1908. No. 1183 D.

The Design of Aeroplanes (Die Berechnung von Gleitfliegern). A. Baumann. A mathematical discussion. Ills. Serial, 1st part. 5500 w. Zeitschr d Ver Deutscher Ing—Feb. 20, 1909. No. 3566 D.

A Note on the Theory and Construction of Aeroplanes and Their Propellers (Beitrag zur Theorie und Konstruktion der Drachenflieger und Luftschrauben). G. Killat. Mathematical discussion of propeller design. Ills. 3700 w. Der Motorwagen—Feb. 20, 1909. No. 3393 D.

Longitudinal Stability of Aeroplanes. Henry T. Strong. Explains a method of keeping the line of thrust of propellers always horizontal. 1500 w. Sci Am Sup—Nov. 7, 1908. No. 107.

The Stability of Aeroplanes (Stabilité des Aéroplanes.—Surface métacentrique). M. Brillouin. An elaborate mathematical discussion of the conditions of stability and the design of aeroplanes. Ills. Serial, 1st part. 6500 w. Rev de Mécan—Feb., 1909. No. 3319 E + F.

Form and Stability of Aeroplanes. W. R. Turnbull. A report of researches on five types of aeroplanes. 4000 w. Sci Am Sup—Jan. 30, 1909. No. 2097.

Difficulties in the Construction of Aeroplanes. Herbert Chatley. Describes some of the difficulties in applying the fundamental principles to the construction of actual machines. 5000 w. Jour Soc of Arts—Jan. 1, 1909. No. 1684 A.

The Rôle of Viscosity in Air Support of a Moving Aëroplane. Frank W. Very. Gives theories and experiments of various investigators, especially considering Prof. Langley's views which the writer believes to be wrong. 7000 w. Tech Qr—Dec., 1908. No. 3441 E.

The Theory of Aeroplanes (Essai de Théorie des Aéroplanes). P. Lauriol. An attempt to formulate the fundamental principles of aviation. Ills. Serial, 1st part. 5600 w. Génie Civil—March 27, 1909. No. 4236 D.

Aeroplane Problems. Herbert Chatley. The present number discusses difficult problems in construction. 3000 w. Sci Am Sup—May 22, 1909. Serial. 1st part. No. 4905.

Solution of Flight Problems by Graphical Methods. M. P. Logan. Deals with the problems of horizontal, and of rising and falling flight, developing a method be-

lieved to be of value to designers and engineers. 2000 w. *Engr*, Lond—July 16, 1909. No. 6688 A.

A Note on the Theory of the Aeroplane (Beitrag zur Theorie der Drachenflieger). A. Jarolimek. Mathematical. Ills. 4000 w. *Zeitschr d Oest Ing u Arch Ver*—July 30, 1909. No. 7453 D.

A Criticism of the Aeroplane (Kritik der Drachenflieger). Ansbert Vorreiter. A criticism of various principles and details of construction of the existing machines. Ills. Serial, 1st part. 5000 w. *Zeitschr d Ver Deutscher Ing*—July 10, 1909. No. 7471 D.

The Resistance of the Air and M. Eiffel's Recent Investigations (La Résistance de l'Air et les récentes Expériences de M. G. Eiffel). Paul Renard. Describes the experiments carried out at the Eiffel Tower and discusses the significance of the results. Ills. 4000 w. *Rev Gen des Sci*—Jan. 30, 1909. No. 2627 D.

Gyroscopic Balancing of Aeroplanes. Lucien Fournier. Suggested methods of maintaining equilibrium are illustrated and described. 1400 w. *Sci Am Sup*—May 15, 1909. No. 4640.

The Lift and Drift of Arched Surfaces. Matthew Bacon Sellers. A study of their behavior in a uniform current of air. 2500 w. *Sci Am Sup*—Nov. 14, 1908. No. 245.

The Flight of Birds. F. W. Lanchester. An illustrated study. 3500 w. *Engr*, Lond—Feb. 19, 1909. Serial, 1st part. No. 2903 A.

Some Considerations on the Flight of Birds (Quelques Considérations sur le Vol des Oiseaux). Wilhelm Kress. From *L'Aéro-Mécanique*. Ills. 5000 w. *All Indus*—Dec., 1908. No. 1924 D.

Birds and Aeroplanes (Oiseaux et Aeroplanes). Ch. Weyher. An argument to show that the most successful type of aeroplane will imitate as closely as possible the flight of birds. Ills. 4000 w. *Rev Gen des Sci*—Dec. 30, 1908. No. 1917 D.

The Flight of Birds and Ornithoplanes (Le Vol de l'Oiseau et les Ornithoplanes). A. Etévé. A theoretical discussion of machines intended to imitate mechanically the flight of birds. Ills. Serial, 1st part. 3200 w. *Génie Civil*—Aug. 7, 1909. No. 7934 D.

Aerial Propellers. Sidney H. Hollands. Discusses old and new forms. 1500 w. *Sci Am Sup*—Dec. 11, 1908. No. 1233.

The Theory of Air Propellers (Beitrag zur Theorie der Luftschrauben). Georg Wellner. Mathematical discussion of the theory and design of airship propellers.

Ills. 4000 w. *Zeitschr d Oest Ing u Arch Ver*—Dec. 18, 1908. No. 1980 D.

Some Anchored Tests of Aerial Propellers. Walter A. Scoble. Gives results of some experiments made at the Blythwood Laboratory to determine the effect of varying the different elements and methods of construction. 1200 w. *Engng*—Dec. 25, 1908. No. 1535 A.

Tests of Stationary Aerial Propellers (Essais d'Hélices au Point fixe). M. Boyer-Guillon. Gives results obtained in the Conservatoire National des Arts et Métiers. Ills. 4000 w. *Rev de Mécan*—Feb., 1909. No. 3320 E + F.

Tests of Stationary Aerial Propellers (Essais d'Hélices au Point fixe). M. A. Boyer-Guillon. Describes the method of testing and gives results obtained in the laboratory of the Conservatoire National des Arts et Métiers. Ills. 8000 w. *Mem Soc Ing Civ de France*—Aug., 1909. No. 7905 G.

Insufficiency of the Methods Actually Employed for Measuring the Efficiency of Aerial Propellers (Insuffisance des Méthodes employées actuellement des mesurer le Rendement des Hélices aériennes). Eugène Bolle. Suggests a satisfactory method. 3000 w. *Génie Civil*—Jan. 2, 1909. No. 2638 D.

The Davidson "Gyropter" Flying Machine. Description of a flying machine with gyroscopic rotary lifters with radial aeroplanes. Ills. 1800 w. *Sci Am Sup*—June 5, 1909. No. 5311.

Some Light Engines for Aeroplanes. Illustrates and describes models. 2000 w. *Auto Jour*—Dec. 12, 1908. No. 1099 A.

Power Generation and Transmission in Aeroplanes. W. F. Bradley and H. W. Perry. An illustrated article discussing the mechanical features of the best-known types. 3000 w. *Engineering Magazine*—Jan., 1909. No. 1330 B.

The Influence of Combustion Motors on Transport (Influenza dei Motori ad Essenza nell' Industria dei Trasporti). Giuseppe Colombo. Refers principally to their use in airships and aeroplanes. 5500 w. *Industria*—Nov. 1, 1908. No. 1131 D.

Cross-Country the Aeroplane Now Travels. W. F. Bradley. Illustrated account of recent achievements. 1500 w. *Automobile*—Nov. 19, 1908. No. 371.

An Aeroplane Factory. Jacques Boyer. Illustrated description of the Vorsin factory at Billancourt, France. 900 w. *Sci Am*—Nov. 21, 1908. No. 333.

Some New American Aeroplanes. Brief descriptions of new types. 1000 w. *Sci Am*—June 5, 1909. No. 5359.

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Aeroplane-Type Flying Machines. Harry Wilken Perry. Illustrated review of what has been accomplished. 3000 w. Mach, N Y—Dec., 1908. No. 762 C.

Recent French Aeroplanes and Their Performance. Illustrates and describes recent types. 800 w. Sci Am—June 26, 1909. No. 5894.

The Human Side of Flying. H. Massac Buist. An attempt to introduce the reader to Messrs. Orville and Wilbur Wright at Pau. Ills. 1500 w. Auto Jour—March 6, 1909. Serial, 1st part. No. 3145 A.

A Comparison of American Aeroplanes. Augustus Post. Compares the construction and control of the Curtiss and Wright machines. 3500 w. Am Mach—Vol. 32, No. 33. No. 7164.

Orville Wright's Record Flights at Fort Myer. A report of the government contract tests. Ills. 1000 w. Sci Am—Aug. 7, 1909. No. 6957.

The United States Signal Corps Aeroplane. Illustrated description of the Wright Machine that met the specifications by carrying two men for an hour's flight and making a speed of $42\frac{1}{2}$ miles per hour. 3000 w. Am Mach—Vol. 32, No. 32. No. 7010.

On the Wright Flying-Machine—Concerning Its Construction and Mode of Working. An editorial letter from S. Tolver Preston. 1500 w. Engng—Sept. 3, 1909. No. 7753 A.

The Wright and Voisin Types of Flying Machine: A Comparison. F. W. Lanchester. Read before the Aëronautical Soc. of Gt. Britain. An account of the performance of both machines, comparing the two systems. 5500 w. Engr, Lond—Dec. 18, 1908. No. 1379 A.

Glenn H. Curtiss. An illustrated account of the man, his aeroplane, and the motor. 2000 w. Mach, N Y—Oct., 1909. No. 8289 C.

The Flight of the Curtiss Aeroplane for the Scientific American Trophy. Illustration, with account of the flight. 1200 w. Sci Am—July 24, 1909. No. 6622.

The Smallest Successful American Aeroplane. Illustrated description of the Curtiss machine and its operation. 2000 w. Am Mach—Vol. 32. No. 27. No. 6207.

Aeroplanes of Aerial Experimental Association. G. H. Curtiss. Gives details of four American built machines, with illustrations. 7500 w. Am Mach—Vol. 32. No. 24. No. 5568.

Blériot Aviates Across English Channel. Brief account of the trip and de-

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scription of the monoplane. Ills. 1000 w. Automobile—July 29, 1909. No. 6777.

M. Louis Blériot and His Aeroplanes. Illustrated descriptions of the latest successful monoplanes of this French engineer. 1200 w. Sci Am Sup—Aug. 28, 1909. No. 7381.

The Blériot Monoplane That Flew the Channel. Illustrated description. 2500 w. Am Mach—Vol. 32, No. 34. No. 7349.

The Cross-Channel Flight. An illustrated account of the feat accomplished by M. Blériot, with description of the aeroplane used. 1000 w. Engr, Lond—July 30, 1909. No. 6989 A.

The Channel Flight. Editorial on the feat of M. Blériot in crossing the English Channel in an aeroplane. 1500 w. Engng—July 30, 1909. No. 6986 A.

The Crossing of the English Channel by M. Blériot (La Traversée de la Manche en Aéroplane par M. Blériot, avec son Monoplan No. XI, 25 Juillet 1909). Describes the aeroplane and gives details of the flight. Ills. 5500 w. Génie Civil—July 31, 1909. No. 7234 D.

Recent Successful French Monoplanes. Illustrated descriptions of the "Antoinette V, the "No. XI" Blériot, and the small monoplane of Santos Dumont. 1000 w. Sci Am—May 8, 1909. No. 4539.

Details of the Antoinette Monoplanes. Augustus Post. Illustrated description of the invention of Léon Levavasseur. 3000 w. Am Mach—Vol. 32. No. 40. No. 8387.

Report on the Award of the Osiris Prize in 1909 (Rapport sur le Prix Osiris à Décerner en 1909). Emile Picard. Reviews the reasons for the choice this year of aviation and the basis of the joint award of this prize of the Institute of France to Voisin and Blériot. 4000 w. Rev Gen des Sciences—July 15, 1909. No. 7218 D.

How to Build a Chanute-Type Glider. Illustrated directions. 1500 w. Sci Am—April 24, 1909. No. 4111.

Test of the Bell Tetrahedral Cell Aeroplane in Nova Scotia. Illustrated account. 500 w. Sci Am—March 13, 1909. No. 3133.

The Ravaut Aero-Hydroplane. Illustrated description of a new type of aeroplane adapted to rise from water. 600 w. Sci Am Sup—May 1, 1909. No. 4333.

The British Army Aeroplane. Brief illustrated description. 600 w. Sci Am—Jan. 30, 1909. No. 2096.

The British Army Aeroplane. An illustrated article giving some impressions.

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and comparisons. 2000 w. *Auto Jour*—Feb. 27, 1909. No. 3048 A.

.Capt. Cody's British Army Aeroplane. Illustrated description of the machine which made a successful flight of over one hour, traveling 47 miles. 1200 w. *Sci Am*—Sept. 18, 1909. No. 7802.

On Dirigible Balloons. Discusses progress shown in recent types, some of the risks, and a few disasters. 3500 w. *Engng*—March 5, 1909. No. 3165 A.

The Vacuum Airship. G. J. Derb. Calls attention to a possible method of dispensing with hydrogen. 1000 w. *Sci Am*—Dec. 19, 1908. No. 1230.

Notes on the Existing Types of Dirigible Balloons (*Beschouwingen over bestaande Typen van bestuurbare Lucht-schepen*). P. J. Post van der Steur. A review of progress in airship construction and of the fundamental theories. Ills. 12500 w. *De Ingenieur*—March 6, 1909. No. 4299 D.

Fundamental Considerations in the Construction of Airships (*Konstruktions Grundlagen von Flug-Fahrzeugen*). Fritz Huth. A theoretical paper. Ills. Serial. 1st part. 2000 w. *Motorwagen*—Jan. 10, 1909. No. 2802 D.

The Dirigible Balloon with Gyroscope Control. Russell Thayer. Briefly reviews the progress in aerial navigation and explains the author's application of the gyroscope to air navigation. Ills. 7000 w. *Jour Fr Inst*—July, 1909. No. 6353 D.

German and French Airships (*Die deutschen und französischen Motorballons*). Ansbert Vorreiter. Describes various airships and reviews progress in this field. Ills. Serial, 1st part. 3500 w. *Zeitschr d Mit Motorwagen Ver*—Dec. 15, 1908. No. 1972 D.

Progress in Airship Construction (*Fortschritte im Luftschiffbau*). Dr. Wagner. Discusses principles of design and describes several types. Ills. 5500 w. *Zeitschr d Ver Deutscher Ing*—July 24, 1909. No. 7478 D.

The Purification of Hydrogen for Use in Aerostatics (*L'Epuraton de l'Hydrogène destiné à l'Aérostation*). Captain Do. A complete practical discussion. Ills. Serial. 1st part. 2000 w. *Tech Mod*—Sept., 1909. No. 8615 D.

Flight of the "Zeppelin I." An account of recent performances of this German airship. 1200 w. *Sci Am Sup*—April 17, 1909. No. 3947.

The Record Flight of "Zeppelin II." Illustrated account of its accident, describ-

ing details. 1800 w. *Sci Am Sup*—July 3, 1909. No. 6092.

The Construction of the Zeppelin Airship. Illustrates and describes the construction of "Zeppelin II." 500 w. *Sci Am*—June 26, 1909. No. 5895.

The German Military "Zeppelin I." Ansbert Vorreiter. Illustrated detailed description of the remodelled third airship of Count von Zeppelin. 2500 w. *Sci Am Sup*—June 12, 1909. No. 5416.

The Parseval Airship. Plans and description of this dirigible airship recently approved by the Prussian War Office. 2000 w. *Engng*—Sept. 10, 1909. No. 7866 A.

The 1908 Parseval Airship (*Das Parsevalsche Motorluftschiff Model 1908*). E. Rumpler. Illustrated description. 3000 w. *Zeitsch d Ver Deutscher Ing*—June 5, 1909. No. 6721 D.

Electricity and Aeronautics (*La Electricidad y la Aeronáutica*). Eduardo Mier. A discussion of the possibility of applying storage batteries and electric motors to the propulsion of air-ships. Serial. 1st part. 2200 w. *Energia Elec*—April 10, 1909. No. 4852 D.

Lightning and the Airship. L. Zehnder. On the dangers of atmospheric electricity in aeronautics. 1500 w. *Sci Am Sup*—Oct. 9, 1909. No. 8414.

The Commercial Airship. C. A. McReady. Analyzes the principles of heavier-than-air, and lighter-than-air, machines, and explains the vacuum airship and its advantages. 1800 w. *Mach, N Y*—Aug., 1909. No. 6809 C.

The Difficulty of Aerial Attack. Sir A. Bannerman. Considers facts bearing on this subject. 3000 w. *Jour Roy U Serv Inst*—May, 1909. No. 5598 N.

Defense of Harbors Against Naval Airships. F. G. Stone. Short papers on airship scouting, introductory to a general discussions of the airship in warfare. 11500 w. *Jour Roy U Serv Inst*—May, 1909. No. 5597 N.

Balloons and Dirigibles in War. H. L. Hawthorne. Discusses the type of weapon to be used against these airships and the character of the ammunition. 3000 w. *Jour U S Art*—Sept.-Oct., 1909. No. 8505 D.

Floating and Flying Navies. J. C. Bayles. An informal discussion of the military value of aerial navigation. 8000 w. *Cassier's Mag*—Dec., 1908. No. 945 B.

The Possibility of Making Use of Balloons and Motor Air-Ships in the Navy. Trans. from an article by Captain Neumann, in *Marine-Rundscha*. A study of what balloons and motor air-ships are

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capable of performing, with special reference to their use for naval purposes. 7000 w. Jour Roy United Serv Inst—Nov., 1908. Serial. 1st part. No. 891 N. Battles in the Sky. Major Goebel. Trans. from *Illust. Zeit.* Discusses the military utility of the airship. 2000 w. Sci Am Sup—Nov. 14, 1908. No. 246.

The Present Status of Military Aeronautics. George O. Squier. An outline of the present state of mechanical flight. Appendices, bibliography, and 25 plates. 28000 w. Jour Am Soc of Mech Engrs—Dec., 1908. No. 836 F.

The Present Status of Military Aeronautics. George O. Squier's paper is discussed. 2000 w. Jour Am Soc of Mech Engrs—Feb., 1909. No. 2408 F.

The Aerodynamic Institute of Kutchino. Illustrated description of a Russian laboratory equipped for students of aeronautics. Translation from *La Nature*. 3500 w. Sci Am Sup—Oct. 16, 1909. No. 8583.

Aeroplane Exhibition in Paris. A brief review, with remarks on the aeroplanes exhibited. 1000 w. Engr, Lond—Jan. 1, 1909. Serial, 1st part. No. 1717 A.

Aeroplanes and Motors at the First Paris Aeronautical Salon. Illustrates some of the exhibits, giving brief descriptions. 1800 w. Sci Am—Jan. 23, 1909. No. 2005.

The Aero Exhibition. A review of exhibits at Olympia. Ills. 2500 w. Engng—March 26, 1909. No. 3788 A.

The Aero Exhibition. Illustrates and describes exhibits at Olympia. 6500 w. Motor Car Jour—March 27, 1909. No. 3772 A.

The Aeroplanes at Rheims. Describes the features of the different machines. 3300 w. Engr, Lond—Sept. 3, 1909. Serial. 1st part. No. 7758 A.

The Aeroplanes at Rheims and Their Records. Augustus Post. An illustrated review of important features of the trials. 2500 w. Am Mach—Vol. 32. No. 38. No. 8012.

The Rheims Aeronautical Meeting. A report of the meeting with illustrations of the aeroplanes. 1600 w. Engr, Lond—Aug. 27, 1909. Serial. 1st part. No. 7662 A.

The Rheims Aviation Meeting. An illustrated account of the first great exhibition of dynamic flight. 2500 w. Sci Am Sup—Sept. 18, 1909. No. 7803.

The Aviation Week at Rheims (La Semaine d'Aviation de Rheims). Describes in detail the aeroplanes, the events, etc. Ills. 9000 w. Génie Civil—Sept. 4, 1909. No. 8626 D.

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The Week of Aviation in Champagne (La grande Semaine d'Aviation de Champagne). L. Marchis. Detailed review of the Rheims meeting. Ills. 6500 w. Tech Mod—Sept., 1909. No. 8614 D.

The Paris Aviation Exhibition. Illustrations and descriptions of the machines shown. 4000 w. Engng—Oct. 1, 1909. Serial. 1st part. No. 8493 A.

Aeronautical Motors in Paris. Illustrations, with descriptions, of motors shown at the exhibition. 1800 w. Engr, Lond—Oct. 1, 1909. No. 8496 A.

See also Exhibitions under AUTOMOBILES; Gasoline Engines, under COMBUSTION MOTORS; and Propellers, under MARINE AND NAVAL ENGINEERING.

Agricultural Machinery.

The Repair of Farm Equipment. W. R. Beattie. Illustrates and describes useful tools for the farmer. 6000 w. Sci Am Sup—May 29, 1909. Serial. 1st part. No. 5027.

Air Resistance.

Theory of the Resistance of Air to the Passage of Plates (Théorie de la Résistance à l'Avancement des Plaques dans l'Air). M. F. Chaudy. Derives a formula based on Eiffel's results. Ills. 6000 w. Mem Soc Ing Civ de France—Aug., 1909. No. 7906 G.

Brick Presses.

A Large Automatic Brick Press. Harry E. Atkins. Illustrated description. 800 w. Am Mach—Vol. 32. No. 42. No. 8804.

Calculating Machines.

Mechanical Arithmetic and Time-Saving Devices. The first of a series of articles explaining devices for facilitating mathematical calculations. 800 w. Auto Jour—Jan. 16, 1909. Serial, 1st part. No. 2049 A.

Carbonic Acid.

The Physical Properties of Carbonic Acid and the Conditions of Its Economic Storage for Transportation. Prof. R. T. Stewart. Gives tables and charts showing the physical properties, results of the author's experiments on commercial carbonic acid in steel cylinders, and a method of designing commercial carbonic acid cylinders. 13500 w. Jour Am Soc of Mech Engrs—Nov., 1908. No. 643 F.

The Physical Properties of Carbonic Acid and the Conditions of its Economic Storage for Transportation. R. T. Stewart's paper is discussed. 4500 w. Jour Am Soc of Mech Engrs—June, 1909. No. 5844 F.

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Telling Time by Automatic Machinery. Snowden B. Redfield. Illustrates and describes devices for keeping a number of clocks in uniform time, ringing bells at intervals, and various other automatic arrangements. 5500 w. Am Mach—Vol. 32. No. 39. No. 8200.

Efficiency.

Efficiency. Alfred T. Best. An explanation of the technical meaning of efficiency, giving particulars of the ratios usually obtained in various types of machinery, and examples of calculations. 2000 w. Mech Engr—March 19, 1909. No. 3608 A.

Empirical Formulae.

The Derivation of Empirical Formulas. John B. Peddle. Explains the derivation of equations to fit empirical data in the form of curves or charts. 9500 w. Am Mach—Vol. 32. No. 38. No. 8014.

English Practice.

Recent Developments in Engineering Practice in England. J. F. B. Vandeleur. Read before the Engrs' Club, Toronto. A review of recent developments in civil, mechanical, and electrical engineering. 3500 w. Can Engr—April 30, 1909. No. 4379.

Engraving Blocks.

Making an Engraving Block. Ethan Viell. Illustrates and describes the methods of manufacture. 2000 w. Mach, N Y—June, 1909. No. 5180 C.

Flour Milling Machinery.

See Reinforced Concrete, under CIVIL ENGINEERING, CONSTRUCTION.

Guns.

Field Guns for Destroying Dirigibles. Illustrates and describes recent German artillery and shells specially designed for bringing down military airships. 2500 w. Sci Am Sup—May 29, 1909. No. 5028.

The Design of Weapons for Attacking Airships. Considers the requirements of such weapons, principally discussing attacks on dirigible balloons. 2500 w. Engr, Lond—May 14, 1909. No. 4970 A.

Recent Developments in Quick-Firing Field Guns. Illustrated descriptions of French, German and English recoil gears, and their advantages. 4000 w. Engr, Lond—June 25, 1909. No. 6285 A.

The Engineering of Ordnance. A. Trevor Dawson. The Gustave Canet lecture of the Junior Inst. of Engrs. The present number considers the influence of metal-

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lurgy on guns, and the influence of powders and explosive compounds on the ballistics of guns. Ills. 7000 w. Engng—July 2, 1909. Serial, 1st part. No. 6308 A.

The Life and Power of Heavy Ordnance. Editorial review of recent articles dealing with this subject, and a comparison of British and German guns. 2500 w. Engng—July 23, 1909. No. 6852 A.

Gyroscopes.

Recent Development in Gyroscope Design. Describes a new form for engineering use invented by Prof. Narciss Ach. 3000 w. Sci Am Sup—Nov. 21, 1908. No. 335.

Gyrostats.

Some Practical Aspects of Gyrostatic Action. W. S. Franklin. A discussion or explanation of gyrostatic action, giving formula for the calculation of torque-reaction due to precession. Ills. 4500 w. Pop Sci M—July, 1909. No. 6343 C.

Kneading Machines.

Comparative Investigations of Mechanical Kneading (*Expériences comparatives de Pétrissage mécanique et de Pétrissage à Bras*). G. Coupan. Describes various kneading machines and discusses their operation and efficiency. Ills. Serial. 1st part. 6400 w. Génie Civil—Sept. 18, 1909. No. 8632 D.

Laundry Machinery.

Steel-Bed Ironing-Machine. Illustrated description of these machines. 1100 w. Engng—June 18, 1909. No. 6046 A.

Leibnitz.

The Work of Leibnitz in Physical Science and Technology (*Leibnizens Arbeiten auf physikalischem und technischem Gebiet*). E. Gerland. A brief historical review. Ills. 6000 w. Zeitschr d Ver Deutscher Ing—Aug. 14, 1909. No. 8151 D.

Mathematics.

Mathematical Methods in the Investigation of Mechanical Problems (*Mathematische Methoden zur Untersuchung mechanischer Probleme*). Paul Stäckel. A discussion of the relation between mathematical theory and practical experiment. 4400 w. Zeitschr d Ver Deutscher Ing—Dec. 19, 1908. No. 2104 D.

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The Manufacture of United States Money. Illustrates and describes methods and appliances used in the Philadelphia mint. 3000 w. Am Mach—Vol. 32. No. 21. No. 5014.

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Mixing Machines.

The Laurica Mixing and Kneading Machine. Illustrated description of an ingenious machine for mixing all kinds of materials and for kneading dough. 1200 w. Engng—Aug. 20, 1909. No. 7444 A.

Oxygen.

The Commercial Production of Oxygen. Dr. Alfred Gradenwitz. Illustrated description of the improved Claude process. 1500 w. Sci Am Sup—April 10, 1909. No. 3843.

Phonographs.

The Production of Sound by Machinery. S. I. Oeisterreicher. Discussion and description of mechanical devices designed to talk and to reproduce spoken words and musical notes. 3500 w. Am Mach—Vol. 32. No. 23. No. 5351.

Progress.

Some Recent Advances in Mechanical Engineering. Carl C. Thomas. Considers development in steam turbines, gas engines, progress in cutting metals, and various other developments. Ills. 4000 w. Wis Engr—Feb., 1909. No. 4314 D.

Review of 1908.

Mechanical Engineering. Reviews improvements in marine engines, rolling stock, automatic couplers, internal combustion engines, etc. 5500 w. Engr, Lond—Jan. 1, 1909. No. 1718 A.

Mechanical Engineering in 1908 (*La Mécanique en 1908*). M. G. Richard. A general review of progress, particularly in steam engineering. Ills. 6000 w. Bul Soc d'Encour—Jan., 1909. No. 3309 G.

Safety Devices.

Safety Appliances in German Machine Shops. Illustrated descriptions of simple guards and operating devices to protect workmen. 1200 w. Am Mach—Vol. 32. No. 7. No. 2514.

Recent Safety Appliances on Carding Engines in Cotton-Mills. Illustrated descriptions of devices for the protection of carding-engines. 2500 w. Engng—June 25, 1909. No. 6279 A.

Safety Appliances on Cotton-Scutchers and Lap-Machines. Explains the dangers to workmen and illustrates and describes appliances for their protection. 2500 w. Engng—Dec. 18, 1908. No. 1369 A.

The Prevention of Accidents in Mechanical Workshops (*Contributo alla Prevenzione degli Infortuni nelle Officine meccaniche*). F. Massarelli. The first

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part begins a discussion of hand labor. Ills. Serial. 1st part. 2500 w. Industria—Nov. 22, 1908. No. 1134 D.

Scientific Follies.

Famous Follies of Science. John Hays Hammond, Jr. Discusses the efforts at circle squaring, schemes for perpetual motion, etc. 3000 w. Yale Sci M—May, 1909. Serial. 1st part. No. 4751 C.

Sugar Machinery.

The Hyros-Rak Diffusion Plant. Illustrated description of an apparatus designed for extracting sugar from beet by a continuous process of diffusion. 900 w. Engng—Feb. 26, 1909. No. 3064 A.

A Large Sugar-Cane Mill. Illustrated description of a new eleven-roller sugar-cane mill, said to be the largest and most powerful yet constructed. 1000 w. Engr, Lond—Feb. 19, 1909. No. 2902 A.

Textile Machinery.

Analysis of Power Distribution in a Cotton Spinning Frame. Albert Walton. An illustrated article discussing in detail a chart obtained in a testing set with electric driving. 3000 w. Cassier's Mag—Aug., 1909. No. 7038 B.

Textile Mills.

The Modern Cotton Spinning Factory. William H. Booth. An illustrated review of the present state of the cotton textile art. 8800 w. Cassier's Mag—Jan., 1909. Serial, 1st part. No. 1724 B.

Removal of Dust from Card-Rooms of Cotton Mills. Illustrated description of the "Hall and Key" method, designed to remove the stripping dust as rapidly as it is produced. Also the design of Herbert Smethurst & Co. 1200 w. Engr, Lond—Jan. 29, 1909. No. 2371 A.

The Cotton Industry in India. John Wallace. An illustrated account of the conditions in India and the development of this industry, and the application of modern methods. 4500 w. Cassier's Mag—April, 1909. No. 3635 B.

Type-Setting Machines.

Type-casting and Composing Machinery. L. A. Legros. Deals with typographic surfaces which are produced directly by movable type or indirectly by means of movable matrices. Ills. 32500 w. Inst of Mech Engrs—Dec. 18, 1908. No. 1508 N.

Weighing Machines

Automatic Weighing Machine. Illustrated description of a battery of Stacey

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grain weighers and their operation. 1200
w. Engr, Lond—Jan. 22, 1909. No. 2226 A.

A Weighing Machine with Automatic Slide (Le Système de Bascule à Curseur automatique). Leon Masson. Detailed description of a scale in which the slide is automatically operated by clock work, which also operates indicating and re-

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cording devices. Ills. 2500 w. Bul Soc d'Encour—June, 1909. No. 7216 G.

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Women Inventors and Discoverers. James Johnson. Brief review of some of woman's contributions to applied science. 2000 w. Cassier's Mag—Oct., 1909. No. 8465 B.

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Accidents

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Analysis

Accidents.

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The Prevention of Accidents in Coal Mines. E. H. Cox. Considers proper supervision and organization of great value, and that the danger is lessened by using permissible explosives and efficient spraying. 4000 w. Eng. & Min Jour—Aug. 28, 1909. No. 7391.

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Coal Briquetting. R. M. Hale. Illustrated detailed description of the briquetting machine used by the Standard Fuel Co., Birmingham, Ala. 3500 w. Ir Age—Jan. 28, 1909. No. 2119.

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COAL AND COKE

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The Coalfields and Collieries of Chile. Archibald Russell. Outlines the coal deposits on the Pacific coast and gives information in regard to the quality of coal and the mining industry in Chile. 2500 w. Min Jour—Aug. 21, 1909. No. 7430 A.

China.

Coal Mining in China. Thomas T. Read. Information concerning the principal coal fields. Map. 2000 w. Min. & Sci Pr—Jan. 2, 1909. No. 1633.

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Coal Cutting by Machinery in England. J. Hinton. Brief notes expressing opinions of mining experts. 800 w. Eng & Min Jour—March 27, 1909. No. 3533.

Mining Coal with Machines in England. George R. Dixon. Gives detailed costs, showing that the economy is due to the increase in the value of the coal produced, rather than reduction in working costs. 3000 w. Eng & Min Jour—April 17, 1909. No. 4007.

Coal Cutting in Northern Coalfield, England. George R. Dixon. Gives comparison of mining costs and shows that mining machines have increased the earning power and lessened labor. 1800 w. Eng & Min Jour—Dec. 5, 1908. No. 827.

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A Novel Coal and Stone-Cutting Process. Alfred Gradenwitz. Illustrates and describes a system based on the use of driven cables carrying tempered steel cutting points. 2000 w. *Eng & Min Jour*—June 19, 1909. No. 5620.

Electric Coal Cutting at the Julius V Colliery, Brück (Ueber den elektromaschinellen Schrämbetrieb am k. k. Schachte Julius V bei Brück). Oskar Mayer and Jaroslav Plzak. Describes the Siemens-Schuckert machines used, the practice, and the results. Ills. 2600 w. *Oest Zeitschr f Berg u Hüttenwesen*—Feb. 27, 1909. No. 3368 D.

The Employment of Coal-Cutting Machines in the Ruhr District, Germany (Zur Frage der Verwendung der Schrämmaschine im Ruhrkohlenbergbau). Ernst Jüngst. A critical examination of their economy. 5400 w. *Glückauf*—July 3, 1909. No. 7272 D.

Coke-Oven Gas.

Comparison Between the Value of Surplus Gas from Regenerator By-Product Coke Ovens, with Special Reference to the Evence Coppee New By-Product Ovens. Mansfeldt H. Mills. Paper read before the Institution of Mining Engineers. 2500 w. *Ir & Coal Trds Rev*—May 28, 1909. No. 5408 A.

The Direct Utilization of Coke-Oven Gas in Combustion Motors (Note sur l'Utilisation directe du Gaz de Four à Coke dans les Moteurs à Explosion). M. E. Cuvelette. An exhaustive discussion of the whole subject. 18000 w. *Mem Soc Ing Civils de France*—Feb., 1909. No. 4807 G.

See also Gas Power Plants, under MECHANICAL ENGINEERING, COMBUSTION MOTORS.

Coke Ovens.

Genesis and Development of the Coking Oven. W. Galloway. Reviews the development, showing that the main features have not changed since 1860. Ills. 3000 w. *Eng & Min Jour*—July 3, 1909. No. 6165.

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The Pyrometry of the Beehive Coke Oven. J. R. Campbell. Read before the

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Coking

Coal Min. Inst. of Am. Describes devices used and methods employed in taking temperatures. 3000 w. *Eng & Min Jour*—July 17, 1909. No. 6393.

Progress in By-Product Coke-Oven Construction at Indianapolis. Illustrated detailed description of plant to supply both gas and fuel. 2500 w. *Pro Age*—March 15, 1909. No. 3116.

The Smoky Bee-Hives of Birmingham. Lee M'Crae. Brief description of largest battery of coke ovens in the world. Ills. 700 w. *Min Wld*—June 5, 1909. No. 5383.

An Elongated Coke Oven. W. R. Elliott. Illustrated description of a method of coking by which coal is charged into ovens on trains of cars and hauled out when coked. 2500 w. *Mines & Min*—March, 1909. No. 2953 C.

By-Product Coke Ovens. Abstract of information in regard to coke ovens, from a report of R. Forbes Carpenter. 2500 w. *Col Guard*—July 2, 1909. No. 6301 A.

The By-Product Coke Oven in Great Britain; Some Characteristic Features of English Coking Coals and New Recovery Processes. D. Bagley. Abstract of a paper before the Int. Cong. of Ap. Chem. 1600 w. *Ir & Coal Trds Rev*—June 11, 1909. No. 5667 A.

New Coke Ovens and By-Product Plant at Auckland Park Colliery. Illustrated description. 1800 w. *Ir & Coal Trds Rev*—June 4, 1909. No. 5537 A.

The Koppers By-Product Coke Oven. Illustrated detailed description of two plants recently erected in England, explaining the special features of this system. 2000 w. *Col Guard*—July 2, 1909. No. 6300 A.

Huessener Waste Heat Coke Oven. Illustrated description of a typical installation of these coke ovens and by-product plants, stating their advantages. 2500 w. *Col Guard*—July 16, 1909. No. 6681 A.

Levellers for Coke Ovens. A. Thau, in Glückauf. Illustrates and describes types of mechanical levellers. 1000 w. *Col Guard*—Nov. 6, 1908. No. 317 A.

Coke-Squeezing Machines.

Electrically Operated Coke-Squeezing Machines. Alfred Gradenwitz. Illustrated descriptions of machines at European mines. 800 w. *Eng & Min Jour*—March 27, 1909. No. 3532.

Coking.

Washed Coal for Coke Making. Walter J. May. Brief consideration of the possibility of making good coke from coal

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Coking By-Products

wastes. 1200 w. *Prac Engr*—March 12, 1909. No. 3409 A.

See also Washing, under COAL AND COKE.

Coking By-Products.

Koppers Ammonia Sulphate Plant. Describes the main features of this new process, recently installed at the new coke plant at Gary, Ind. Ills. 4500 w. *Pro Age*—July 1, 1909. No. 6057.

Experiments with Gas Coals. J. Ferguson Bell. Abstract of a paper entitled "Carbonizing," read before the Inst. of Gas Engrs. A report of experiments to ascertain the effect of varying the weight and period of carbonization upon by-products. 2500 w. *Ir & Coal Trds Rev*—June 18, 1909. No. 6054 A.

The Production of Benzol in the Coking of Bituminous Coal (*Steinkohlen-verkokung und Benzolgewinnung*). Dr. Fritz Hönigsberger. Discusses benzol as an automobile fuel and the method of its production in by-product coking. Ills. 5000 w. *Zeitschr d Mit Motorwagen-Ver*—Nov. 30, 1908. No. 1176 D.

Coking Plants.

Jones & Laughlin's Coke Plant. William L. Affelder. Illustrated description of an installation of 1500 coke ovens in Pittsburg. 3500 w. *Mines & Min*—Dec., 1908. No. 715 C.

Coking Plant at the Midland Coal, Coke and Iron Company, Limited, Ape-dale, Staffs. Illustrated description. 1500 w. *Ir & Coal Trds Rev*—March 19, 1909. No. 3630 A.

Gas and Electric Plants at Collieries. Mr. Holt. Paper read before the Nat. Assn. of Col. Mgrs. Deals principally with the plants at the Powell Duffryn Colliery. 3500 w. *Ir & Coal Trds Rev*—March 5, 1909. No. 3181 A.

Donahoe Coke Co. C. R. King. Describes the works and mine and methods of operating. Ills. 5500 w. *Mines & Min*—May, 1909. No. 4478 C.

The Greatest Bakery in the World. George Frederic Stratton. Illustrated description of coke-making in the Connells-ville region. 2200 w. *Am Mach*—Vol 32. No. 31. No. 6897.

The Mexican Coke Industry. R. D. Martin. Illustrates and describes types of ovens and methods of utilizing the waste heat under boilers. 3000 w. *Mines & Min*—Oct., 1909. No. 8253 C.

See also Pyrometry, and Washing, under COAL AND COKE.

COAL AND COKE

Coking Properties.

A Study of the Coking Properties of Coals (*Etude sur les Charbons et leur Pouvoir cokéfiant*). O. Boudouard. An important investigation of the influence of composition, structure, etc. 6500 w. *Rev de Mécan*—April, 1909. No. 4819 E + F.

Colorado.

Routt County, Colorado, Coals. R. L. Herrick. A compilation from various sources concerning the geology, deposits, qualities, etc. Ills. 5000 w. *Mines & Min*—Dec., 1908. No. 719 C.

The Delgua Mines of the Victor Fuel Co. F. W. Whiteside. Describes an adaptation of surface arrangements to suit peculiar topography and location of mine openings. Ills. 2000 w. *Mines & Min*—Feb. 1, 1909. No. 2231 C.

Conservation.

Needs for Conservation of Our Coal Deposits. J. V. Thompson. Gives statistics showing the rate of exhaustion. 1000 w. *Pro Am Min Cong*—1908. No. 4132 N.

Conservation in the Mining Industry. Frank M. Osborne. Especially considers the coal fields and the need of economic methods. 1500 w. *Pro Am Min Cong*—1908. No. 4122 N.

Conservation in the Coal Industry. John Mitchell. Discusses fuel resources and the protection of human life in mines. 4500 w. *Pro Am Min Cong*—1908. No. 4134 N.

Conservation in the Coal Industry, Protection of Life and Prevention of Waste. Glenn W. Traer. A discussion of present conditions, and the remedies needed. 5200 w. *Pro Am Min Cong*—1908. No. 4130 N.

See also Natural Resources, under INDUSTRIAL ECONOMY.

Dust Extractors.

Appliances for Dealing With Coal Dust at the Pit Mouth. Illustrates and describes devices in use at different collieries for preventing the spread of coal dust or removing it. 3000 w. *Ir & Coal Trds Rev*—Jan. 8, 1909. No. 1829 A.

Economics.

Financial Burdens on Collieries. An explanation of the conditions of working collieries in Great Britain. 2200 w. *Engr*, Lond—May 21, 1909. No. 5198 A.

Electric Power.

Electricity in Mines. George R. Wood. Outlines the ordinary mine development and some of the standard electrical equip-

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Electric Power

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ment, describing typical coal-mining plants. 4500 w. *Pro Am Inst of Elec Engrs*—Aug., 1909. No. 7058 F.

Safe Use of Electricity in Coal Mining. George R. Wood. Read before the Coal Min. Inst. of America. Suggestions as to proper voltage, insulation, etc. 3500 w. *Eng & Min Jour*—July 3, 1909. No. 6168.

Safe Use of Electricity in Mines. George R. Wood. Read before the Coal Min. Inst. of Am. Considers electric coal cutters and dust; shocks from electric wires, and electrolysis. 4000 w. *Mines & Min*—Aug., 1909. No. 6885 C.

Development of Electric Power in Coal Mines. George E. Walsh. Remarks on the Applications, recent installations, etc. 2000 w. *Eng & Min Jour*—Nov. 21, 1908. No. 410.

The Application of Electricity to Mining. W. E. Dickinson. Specially considers the application of electricity to coal mining, and the advantage of an a. c. system. 2500 w. *Sibley Jour of Enngs*—Feb., 1909. No. 3251 C.

Electricity in the Coal Mining Industry. Abstract of a paper by F. C. Albrecht, before the W. Va. Coal Min. Inst. On the applications made and advantages, methods, etc. 2000 w. *Elec Rev, N Y*—Oct. 2, 1909. No. 8308.

The Electrical and Coal Mining Industries. F. C. Albrecht. Abstract of a paper before the W. Va. Coal Min. Inst. Suggestions for the use of electricity in mines. 2000 w. *Eng & Min Jour*—July 24, 1909. No. 6642.

Electricity in Coal Mines. Robert Nelson. Read before the Inst. of Min. Engrs. Considers the practical application of electricity to coal mining from the point of view of safety. 11500 w. *Col Guard*—June 4, 1909. No. 5525 A.

Notes on Safety of Working Electrical Plants in Coal Mines. Sidney A. Simon. Read before the Glasgow Sec. of the Inst. of Elec. Engrs. Reviews experience since the new rules of the Home Office have been in force, and gives an account of tests made in Germany and the results. 5000 w. *Elec Engr, Lond*—March 26, 1909. Serial, 1st part. No. 3777 A.

Electricity at a Colliery. Illustrates and describes a plant recently installed at Shamrock Colliery. 1800 w. *Engr, Lond*—May 14, 1909. No. 4972 A.

The Mines Eight Hours Act and Its Stimulus to Electrical Underground Haulage. Discusses change of equipment and methods in which mechanical devices will replace labor. 2500 w. *Ir.*

& Coal Trds Rev—May 28, 1909. No. 5409 A.

Mining Motors and Switchgear. William Maurice. A lecture at the University College, Nottingham, on the available apparatus for electrical applications in mines. Ills. 6500 w. *Ir & Coal Trds Rev*—April 9, 1909. No. 4043 A.

Electric Circuit Problems, Design and Testing. Shows, by worked out examples, how to determine the factors entering into the various problems. 2000 w. *Col Guard*—Aug. 6, 1909. Serial, 1st part. No. 7100 A.

Colliery Shaft Cables. William Cope-land. Considers briefly the kinds of cables used, their troubles and the causes. 1500 w. *Elec Engr, Lond*—Aug. 13, 1909. No. 7197 A.

Electrical Power Generation and Distribution at the Collieries of the Lochgelly Iron & Coal Co., Fife. John Paul. Abstract of a paper read before the Min. Inst. of Scotland. Illustrated description. 2500 w. *Elect'n, Lond*—Sept. 10, 1909. No. 7860 A.

Electricity in Coal Mines, New South Wales. A. A. Atkinson and W. Humble. Read before the N Engrg Inst, N. S. W. Describes plants, accidents, and precautionary measures necessary. 2500 w. *Aust Min Stand*—June 23, 1909. Serial, 1st part. No. 6866 B.

Some Applications of Electric Power in Belgium (Quelques Applications de l'Electrotechnique en Belgique). Alfred Lambotte. The fifth part describes the installations of the Société des Charbonnages de Courcelles-Nord. Ills. 6000 w. *Soc Belge d Elecns*—Nov., 1908. No. 1100 E.

Some Applications of Electric Power in Belgium (Quelques Applications de l'Electrotechnique en Belgique). Alfred Lambotte. This sixth and last article of the series on electric power in mining describes the electric installations of the Ressaix, Leval, Péronnes, Sainte-Aldegonde and Genck Collieries Company. Ills. Tables. 1500 w. *Soc Belge d'Elecns*—Dec., 1908. No. 1901 E.

Electric Installations of the Laura and Vereeniging Collieries (Installations électriques des Charbonnages réunis Laura et Vereeniging). Albert Genart. Illustrated description of the plants of this company in Holland. 6800 w. *All Indus*—Feb., 1909. No. 3325 D.

See also Accidents, and Coking Plants, under COAL AND COKE; and Central Stations, under ELECTRICAL ENGINEERING, GENERATING STATIONS.

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England

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Explosions

England.

Our Steam Coal and Its Uses. Sir Lees Knowles. From presidential address before the Manchester Geol. & Min. Soc. 4000 w. Col Guard—Dec. 18, 1908. No. 1368 A.

Coal Mining Methods in England. Floyd W. Parsons. Illustrates and describes the methods and equipment at the Hulton Colliery. No explosives used. Ventilated by underground fans. 2500 w. Eng & Min Jour—Sept. 25, 1909. No. 8072.

The Geology of the Country between Newark and Nottingham. Information concerning these coal measures in England taken from a recent report of the Geol. Survey. 5000 w. Ir & Coal Trds Rev—Jan. 15, 1909. No. 2085 A.

Geology of Lower Coal Measures of Derbyshire and Nottinghamshire. R. D. Vernon. Extracted from *Geol. Mag.* Discusses the evidence afforded by boreholes and sinkings for the presence of these lower coal measures. Ills. 1700 w. Col Guard—Aug. 27, 1909. Serial. 1st part. No. 7650 A.

Coal Mines Inspection in 1908. Digest of the reports of H. M. inspectors of mines. 55000 w. Col Guard—Aug. 6, 1909 (Sup.). No. 7099 A.

See also Economics, under COAL AND COKE.

Europe.

Brief Notes on European Coal Mines. Floyd W. Parsons. Considers some reasons why the coal industry abroad is on a more profitable basis. Ills. 1600 w. Eng & Min Jour—Sept. 11, 1909. No. 7679.

Explosions.

Prevention of Coal Dust Explosions in Mines. William N. Page. Gives reducing the velocity of ventilating currents as an effective remedy. 1500 w. Min Wld—Nov. 28, 1908. No. 710.

Views Respecting Coal Mine Explosions. A symposium of opinions from engineers in reply to recent arguments advanced to explain causes of coal mine explosions. 6000 w. Eng & Min Jour—Jan. 2, 1909. No. 1439.

Prevention of Mine Explosions. James Ashworth. Reviews the report by the foreign experts who visited the United States by invitation of the Government. 1700 w. Mines & Min—Feb., 1909. No. 2233 C.

Mine Accidents. Sim. Reynolds. Discusses some of the little things that cause them. 2500 w. Mines & Min—April, 1909. No. 3673 C.

Overcoming Coal-Mine Disasters. Guy Elliott Mitchell. Describes the work of the U. S. government in explosion investigations and life-saving in the mines. Ills. 3500 w. Am Rev of Revs—May, 1909. No. 4525 C.

Some Simple Causes of Mine Explosions. L. D. Tracy. Explains explosions due to the ignorance or carelessness of the human element, and to preventable causes. 2500 w. Eng News—July 1, 1909. No. 6082.

The Prevention of Mine Explosions. Recommendations of a committee appointed to investigate coal mine explosions. 2500 w. Can Min Jour—Nov. 15, 1908. No. 464.

Ignition of Firedamp Mixtures by Incandescent Electric Filaments and Sparks. H. Couriot and J. Meunier, in *Bul. Soc. Indus. Min.* Report of tests. 900 w. Col Guard—Feb. 26, 1909. No. 3061 A.

Mine Explosions as Related to Earthquakes. W. A. Spaulding. A discussion favoring the theory that the danger from explosions in deep mines is augmented during periods of seismic disturbance. 2500 w. Eng & Min Jour—Feb. 20, 1909. No. 2560.

Mine Explosions as Related to Earthquakes. W. A. Spaulding. Shows that an earthquake may cause an outflow of gas in a distant mine. 2500 w. Eng & Min Jour—Sept. 18, 1909. No. 7825.

Seismic Disturbances and Coal Mine Explosions. Audley H. Stow. A discussion of the possible effect of seismic disturbances on the accumulation of gas in coal and its extension into the workings. 2500 w. Eng & Min Jour—Sept. 4, 1909. No. 7565.

The Phenomena Preceding Gas Explosions. Francis Laur. A study of the relation of sidereal influences to gas explosions in mines. 3500 w. Eng & Min Jour—Sept. 11, 1909. No. 7680.

Effect of Humidity on Mine Explosions. Discussion of the paper by Carl Scholz. 3000 w. Bul Am Inst of Min Engrs—June, 1904. No. 5851 F.

Means for the Prevention of Gas and Dust Explosions (Mittel zur Verhütung von Schlagwetter- und Kohlenstaubexplosionen). Report of tests by the Austrian Committee for the Investigation of mine-gas explosion problems. Ills. Serial. 1st part. 6000 w. Oest Zeitschr f Berg u Hüttenwesen—April 3, 1909. No. 4864 D.

Mine Gases and Colliery Explosions. H. B. Winstanley. Read before the Nat. Assn. of Col. Mgrs. A record of available information relating to mine gases.

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10000 w. Ir & Coal Trds Rev—Oct. 8, 1909. No. 8959 A.

Notes on Explosive Mine Gases and Dusts, with Special Reference to Explosions in the Monongah, Darr, and Naomi Coal Mines. Rollin Thomas Chamberlin. 25000 w. U. S. Geol Survey—Bul. 383. No. 7016 N.

Dust-Explosions in Coal-Mines. Franklin Bache. Thinks the aim should be to get rid of the dust, and discusses methods. 2500 w. Bul Am Inst of Min Engrs—Aug., 1909. No. 7127 F.

Facts Concerning the Marianna Explosion. Floyd W. Parsons. An illustrated discussion of the cause of the accident at this model mine in Pennsylvania. The fan indicator diagram shows that ventilation stopped 25 minutes before the explosion. Also editorial. 4500 w. Eng & Min Jour—Dec. 12, 1908. No. 967.

The Marianna Explosion. Plan and description of this mine in Western Pennsylvania and the accident, with reports of inspectors, etc. 8500 w. Mines & Min—Jan., 1909. No. 1414 C.

Lick Branch Disaster. H. H. Stoek. Maps and description of the mine, with reports of the mining inspectors and other investigators. 7000 w. Mines & Min—March, 1909. No. 2954 C.

Wehrum (Pa.) Mine Explosion. An account of the conditions existing at the mine at the time of the explosion, and the Coroner's verdict. 4000 w. Mines & Min—Sept., 1909. No. 7493 C.

Norton Hill Colliery Explosion. Report by Joseph S. Martin, on the circumstances attending the explosion of April 9, 1908. 3500 w. Col Guard—Oct. 30, 1908. No. 187 A.

West Stanley Colliery Explosion. Report of the circumstances attending the explosion that occurred Feb. 16, 1909. Plans. 3300 w. Col Guard—Aug. 13, 1909. Serial, 1st part. No. 7324 A.

The Experimenting Station at Lievin, France. Tony Callot. Illustrated description of station for experimental research on the coal dust problem. 2500 w. Eng & Min Jour—July 3, 1909. No. 6163.

Testing Station of the Central Committee of French Colliery Owners at Liévin (La Station d'Essais du Comité central des Houillères de France à Liévin). Illustrated description of a station built for the purpose of investigating dust explosions. Ills. 7500 w. Génie Civil—April 10, 1909. No. 4837 D.

The Lievin Testing Station (Description de la Station d'Essais de Liévin). M. J. Taffanel. Illustrated description of a sta-

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tion for investigating problems relating to safety in coal mines. 3200 w. Rev de Métal—July, 1909. No. 7202 E + F.

See also Mine Dust, under COAL AND COKE.

Explosives.

Safety Blasting Explosives. Arthur M. Carney. Discusses the classes and properties of different explosives, and the apparatus and methods used in testing. Ills. 3500 w. Mines & Min—Nov., 1908. No. 30 C.

The Prevention of Mining Accidents. Brief illustrated description of the United States experiment station at Pittsburgh, Pa. 1000 w. Sci Am Sup—Feb. 20, 1909. No. 2529.

"Permissible" Explosives in Mines. Abstract of first report on tests of explosives by U. S. Geological Survey, giving list of permissible explosives tested prior to May 15, 1909. 1400 w. Elec-Chem & Met Ind—June 1909. No. 5348 C.

The Equipment of the United States Explosives Testing Station. Clarence Hall. Official report of the preliminary result of tests, describing the apparatus and methods. Ills. 6000 w. Engineering Magazine—July, 1909. No. 5971 B.

Tests with Compressed Gunpowder, Nitroglycerin and Ammonium Nitrate Explosives in the Schwalbach Mine (Versuche mit komprimiertem Pulver, Nitroglycerin- und Ammonsalpeter-Sprengstoffen im Schwalbach Flöz der Königl. Steinkohlengrube Schwalbach - Saar). Erich Seidl. Describes the tests and gives the results and conclusions drawn from them. Ills. 3100 w. Glückauf—Oct. 31, 1908. No. 558 D.

Tests of Safety Explosives (Versuche mit Sicherheitsprengstoffen). Herr Beyling. Report of tests of various explosives in an atmosphere of fire damp. 2500 w. Glückauf—Dec. 5, 1908. No. 1950 D.

Tests of Safety Explosives (Versuche mit Sicherheitsprengstoffen). Herr Beyling. Gives results of tests on a large number of German explosives. 4500 w. Glückauf—Jan. 23, 1909. No. 2677 D.

The Testing of Safety Explosives in the Experimental Gallery at Neunkirchen (Die Prüfung der Sicherheitsprengstoffe auf der Königlichen Versuchsstrecke zu Neunkirchen bei Saarbrücken). Herr Hatzfeld. Describes the equipment and methods of testing and gives results. 4500 w. Glückauf—June 5, 1909. No. 6572 D.

Formation

COAL AND COKE

Mexico

Formation.

Pressure in the Formation and Alteration of Coal. D. B. Dowling. Gives results of recent experiments on peat, showing that there is some relation between the pressure under which the coal was formed and the resultant compound. 1400 w. Can Min Jour—Feb. 15, 1909. No. 2550.

The Origin of Anthracite Coal. Editorial review of theories advanced, and general agreement reached, with a reference to the recent investigations of A. Strahan and W. Pollard of the coals of South Wales. 1500 w. Engng—April 23, 1909. No. 4464 A.

Petroleum and Coals. Eugene Coste. A comparison of their nature, mode of occurrence and origin, aiming to demonstrate that there are really two series of natural compounds of carbon. 5500 w. Can Min Jour—May 15, 1909. Serial. 1st part. No. 4770.

Germany.

The Geological Structure between Menden and Witten (Beiträge zur Kenntnis des Schichtenaufbaus zwischen Menden und Witten). Herr Kokuk. Illustrated description of the formation in this coal district. 3300 w. Glückauf—Nov. 21, 1908. No. 1152 D.

A Model Coal Mine in Westphalia. William S. Hall. Describes the Zollern II. Colliery, where 15 seams varying in thickness from 1½ to 10 feet are worked. Each bed is worked by retreating and the product is carefully washed. Ills. 3400 w. Eng & Min Jour—June 5, 1909. No. 5299.

Great Britain.

Geological Research in the Coalfields. Reviews recent work in Great Britain, as reported in the *Summary of Progress of the Geological survey*. 2200 w. Col Guard—Sept. 24, 1909. Serial. 1st part. No. 8350 A.

Wages, Profits, and Royalties in the Coal Trade. An estimate of the average wages, profits, and royalties per ton of coal raised in Great Britain. 1500 w. Engr, Lond—Oct. 1, 1909. No. 8495 A.

Handling.

See Coal Handling, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING.

Illinois.

The Illinois Coal Field. A. Bement. A report of the coal resources of the state, the characteristics of the deposits, quality, etc. Maps. Discussion. 22500 w.

Jour W Soc of Engrs—June, 1909. No. 5877 D.

Studies of Illinois Coals. Gives results of investigations made by experts, with discussions of certain phases, with summary and conclusions. 22500 w. Bul Am Inst of Min Engrs—Nov., 1908. No. 688 E.

Conditions of the Coal Mining Industry of Illinois. David Ross. A critical review. 1800 w. Min Wld—May 22, 1909. No. 4937.

Coal Deposits and Oil Field Near Duquoin, Ill. Jon Udden. Describes the geology, the deposits and production. 2000 w. Min Wld—March 13, 1909. No. 3126.

The Carterville Coal Field, Southern Illinois. R. S. Moss. Illustrated historical review of the development. 1500 w. Min Wld—April 10, 1909. No. 3875

India.

Longwall Working at the Seeteram-mooda, India. Willis Howarth. Explains the physical conditions at Nursamooda, the human conditions, and the mechanical conditions. 2500 w. Ir & Coal Trds Rev—April 30, 1909. No. 4632 A.

Kentucky.

The Middlesboro Coalfield in Kentucky. John Howard. A general review of the conditions at the different mines. Ills. 2500 w. Eng & Min Jour—Aug. 14, 1909. No. 7069.

Lignite.

Decrease in Weight of Lignite in Transit. Arthur C. Scott. Gives results of experiments with Texas lignite to determine changes in weight and heat value due to temperature and humidity conditions. 2500 w. Power—May 11, 1909. No. 4588.

See also Peat, and Texas, under COAL AND COKE.

Mexico.

The Coal Industry in Mexico. Edwif Ludlow. Read at session of the Int. Geol. Cong. Important coalfields have been discovered and are being so developed that Mexico will soon be independent of all foreign fuel supplies. Map. 3500 w. Eng & Min Jour—Oct. 2, 1909. No. 8272.

The Carboniferous Deposits of Northern Coahuila. J. G. Aguilera. Describes the geology of an important coal field in Mexico. 3500 w. Eng & Min Jour—Oct. 9, 1909. No. 8429.

See also Coking Plants, under COAL AND COKE.

MINING AND METALLURGY

Mine Conveyors

Mine Conveyors.

A New Underground Conveyor. Illustrates and describes the Bothwell conveyor, which has been in use several months with satisfactory results. It is patented by Richard McPhee. 2500 w. Col Guard—Sept. 24, 1909. No. 8357 A.

Mine Dust.

Dust as a Factor in Mine Explosions. William N. Page. Considers the watering of mines to be dangerous, and gives recommendations. 1500 w. Eng & Min Jour—Dec. 5, 1908. No. 828.

Is Coal Dust, as Such, Explosive? Audley H. Stow. A study of the chemical reactions that occur in dust explosions. 4000 w. Eng & Min Jour—Jan. 2, 1909. No. 1440.

Spraying Coal Dust as a Colliery Safeguard. D. Harrington. Describes a sprinkling system, giving detailed costs of installation and operating as carried on in the mines of Utah. 3500 w. Eng & Min Jour—Jan. 23, 1909. No. 2030.

The Coal-Dust Problem. John Verner. Address before the Fuel Conference, at Urbana, Ill. Discusses the mechanical influence of air currents in furnishing conditions favorable to a dust explosion. 5000 w. Mines & Min—May, 1909. No. 4480 C.

The Present Position of the Coal Dust Problem. James and John Ashworth. Read before the Can. Min. Inst. Discusses coal dust as connected with colliery explosions. 2000 w. Can Min Jour—Nov. 1, 1908. No. 45.

The Present Position of the Coal Dust Problem. James and John Ashworth. Discusses various phases of this problem. 2500 w. Bul Can Min Inst—Jan., 1909. No. 2044 N.

British Coal-Dust Experiments. Gives results of 26 experiments with coal and stone dust at Altofts. Ills. 4500 w. Mines & Min—Dec., 1908. No. 720 C.

British Coal Dust Experiments. Illustrated description of recent experiments with coal dust and stone dust at the Altofts Experimental Gallery. 2500 w. Ir & Coal Trds Rev—Oct. 1, 1909. No. 8956 A.

The British Coal Dust Experiments. An illustrated account of work at the Experiments Station at Altofts since August, 1908, in connection with the problem of coal-dust explosions. Plate. 4000 w. Col Guard—July 30, 1909. No. 6082 A.

The Coal Dust Question in Great Britain. Henry Hall. Shows how legislature has reduced the number of explosions. 7500 w. Eng & Min Jour—May 29, 1909. No. 5161.

COAL AND COKE

Mine Fires

French Coal-Dust Experiments. M. J. Taffanel. Abstracted from Pro. of S. W. Inst. of Engrs. Illustrated detailed description of the experimental station: 2000 w. Col Guard—Aug. 6, 1909. Serial, 1st part. No. 7101 A.

The Method of Dealing with the Danger from Coal Dust in the Westphalian Coal District. Read before the Int. Cong. of Ap. Chem. Reports effect of watering and other causes. 1200 w. Col Guard—June 11, 1909. Serial. 1st part. No. 5656 A.

Dust Removal Devices in the Rhine Lignite District (Ueber Entstaubungsanlagen im rheinischen Braunkohlenindustriebezirk). Herr Baldus. Illustrated description of methods of removing dust from mine air. Serial. 1st part. 2600 w. Glückauf—Dec. 5, 1908. No. 1952 D.

Coal Dust Experiments at the Experimental Gallery of the Rossitz Coalfield. Dr. Czaplinski and J. Jisinsky. Trans. from *Zeit. für Berg- und Hüttenwesen*. Describes experiments to determine the conditions under which coal dust is liable to explode. 800 w. Ir & Coal Trds Rev—Sept. 10, 1909. Serial. 1st part. No. 7871 A.

Experiments With Coal Dust at the Rossitz Experimental Gallery. Czaplinski and Jicinsky, in *Oes. Zeit. für Berg- und Hüttenwesen*. Describes experiments made to ascertain the conditions under which coal-dust can explode, and to test means of preventing coal-dust explosions. Ills. 2000 w. Col Guard—Sept. 24, 1909. Serial. 1st part. No. 8358 A.

Coal-Dust Experiments in the Testing Gallery of the Rossitz District (Versuche mit Kohlenstaub im Versuchstollen des Rossitzer Steinkohlenrevieres). Herrn Czaplinski and Jicinsky. Describes the tests and gives results. Ills. Serial. 1st part. Oest Zeitschr f Berg u Hüttenwesen—Aug. 28, 1909. No. 7963 D.

Mine Fires.

Fighting a Mine Fire at Close Range with Oxygen-Breathing Apparatus. F. W. Gray. Illustrates and describes experience at Sydney No. 1 Mine, Nova Scotia. 1600 w. Mines & Min—Dec., 1908. No. 717 C.

Sealing Shafts After Explosion. J. A. Garcia. Describes an attempt to extinguish a mine fire by sealing off the shafts at mine No. 18, Dering Coal Co., Illinois. Ills. 3000 w. Mines & Min—Aug., 1909. No. 6889 C.

Sealing Off Summit Hill Mine Fire. H. H. Stoek. Illustrates and describes the sinking of a line of shafts removing coal

MINING AND METALLURGY

Mine Flushing

and rock, and filling space with clay to form a barrier. 3500 w. *Mines & Min*—Aug., 1909. No. 6880 C.

An Underground Fire Disaster. James Ashworth. An account of the disaster which occurred at Hamstead colliery, England. 2500 w. *Eng & Min Jour*—Nov. 28, 1908. No. 707.

Mine Flushing.

The Flushing Problem in the Anthracite Region. Explains the situation in Pennsylvania, and the danger to surface property, describing the attempt to fill the spaces where coal has been removed. 1500 w. *Eng & Min Jour*—Sept. 18, 1909. No. 7826.

Mine Gas.

The Constituents and Properties of Mine Gases. A. L. Hodges. Discussion of the chemical constitution and properties of poisonous gases. 3400 w. *Min Wld*—June 5, 1909. No. 5378.

Examining for Firedamp. James Ashworth. Reviews reports from a Blue Book recently issued in England concerning the composition of blackdamp, height of testing flame, and the percentage of firedamp that is dangerous. 5000 w. *Mines and Min*—Oct., 1909. No. 8259 C.

The Detection of Firedamp. Describes a proposed method adaptable to ordinary miners' lamps. Ills. 2000 w. *Col Guard*—Oct. 15, 1909. No. 8890 A.

The Influence of Atmospheric Conditions on the Amount of Water and Gas in Mines (Der Einfluss der Luftdruckschwankungen auf den Wasserdrang und den Gasaustritt in Bergwerken). Chr. Mezger. A discussion based on extensive observations. Ills. Serial, 1st part. 5600 w. *Glückauf*—Oct. 24, 1908. No. 557 D.

The Influence of Gas on Changes in Mine Air Pressure (Ueber den Einfluss der Bewetterung auf die Spannungsänderungen der Grubenheft). Chr. Mezger. A discussion based on practical observations. Ills. Serial, 1st part. 2700 w. *Glückauf*—July 31, 1909. No. 7277 D.

See also Safety Lamps, under COAL AND COKE.

Mine Sampling.

Mine Sampling and Chemical Analyses of Coal Tested at the United States Fuel Testing Plant, Norfolk, Va., in 1907. John Shober Burrows. A report of tests. 4000 w. *U. S. Geol Surv*—Bul. 362. No. 1338 N.

Mine Surveying.

See Surveying, under MINING.

COAL AND COKE

Mine Ventilation.

The Regulation of Gas in Mine-Air Currents. John G. Smyth. Read before the W. Va. Coal Min. Inst. Reports investigations, the results of which may aid in eliminating coal-mine explosions. 2000 w. *Eng & Min Jour*—July 3, 1909. No. 6166.

The Ventilation of Mines. Abstract of a lecture by W. H. Hepplewhite. Considers the splitting of the air current, its vagaries, circulation, etc. 2500 w. *Ir & Coal Trds Rev*—Dec. 11, 1908. No. 1226 A.

The Principles of the Ventilation of Mines. A report of the second lecture of W. H. Hepplewhite, entitled, "Some Aspects of Mine Ventilation." 2500 w. *Col Guard*—Dec. 24, 1908. No. 1534 A.

An Inquiry into the Ventilation of Coal Mines and the Methods of Examining for Firedamp. Information from Prof. Cadman's report of investigations made for the Royal Commission. 3000 w. *Ir & Coal Trades Rev*—March 26, 1909. Serial, 1st part. No. 3794 A.

The Ventilation of Coal Mines. Report of the Royal Commission on an inquiry into the ventilation and methods of examining for firedamp, made by John Cadman and E. B. Whaley. 8500 w. *Col Guard*—April 2 and 9, 1909. Serial, 2 parts. No. 4033 each A.

Mining.

Problems of the Coal Mining Industry. Dr. J. A. Holmes. Brief remarks on a few problems such as accidents, smoke, waste, etc. 1000 w. *Pro Am Min Cong*—1908. No. 4125 N.

Value of Efficient Engineering in Coal Mining. L. B. Abbott. Read before the W. Va. Coal Min. Inst. On the importance of system in laying out and equipping mines. 4000 w. *Mines & Min*—July, 1909. No. 6185 C.

Mining Methods for Maximum Recovery of Coal. H. V. Hesse. Considers the important factors that cause loss, discussing improved methods of operation, giving a case where early methods secured about 50% and present methods 95%. Ills. 4000 w. *Eng & Min Jour*—Feb. 6, 1909. No. 2318.

Maximum Recovery of Coal. H. V. Hesse. Shows the waste of early methods of mining in the Georges Creek region, suggesting more economic methods. Ills. 4400 w. *Mines & Min*—March, 1909. No. 2957 C.

A Visit to an Anthracite Coal Mine. Warren O. Rogers. Illustrated description of methods of mining and timbering. 1500 w. *Power*—July 20, 1909. No. 6433.

MINING AND METALLURGY

Mining

Recovering Abandoned Coal Pillars. W. L. Hamilton. Early operators left 60 per cent of coal unmined, and the methods being made to extract this coal are described. 1500 w. Eng & Min Jour—July 3, 1909. No. 6169.

Coal Mining Methods at Gary, West Virginia. John S. Walker. Illustrated description of methods used in mines of the U. S. Steel Corporation, which claim to be the safest in the world. 1500 w. Eng & Min Jour—July 3, 1909. No. 6164.

Pillar Drawing. Jonathan Jenkins. Read before the superintendents and mine foremen of the Consolidated Coal Co., of Frostburg, Md. Detailed description of the work. 3000 w. Mines & Min—Oct., 1909. No. 8258 C.

Pocahontas Region Mining Methods. H. H. Stoeck. Illustrated detailed description of the standard methods of development. 3000 w. Mines & Min—April, 1909. No. 3672 C.

Longwall in Inclined Seams. J. G. MacKenzie. Read before the Nova Scotia Soc. of Engrs. Illustrates and describes the method of working a friable gaseous coal at a depth of over 2,000 feet, at Westville, N. S. 2000 w. Mines & Min—June, 1909. No. 5239 C.

The Cost of Longwall in England. George R. Dixon. Gives details and dimensions of the system. 2000 w. Eng & Min Jour—Nov. 14, 1908. No. 260.

Practice of Coal Mining in Great Britain. Floyd W. Parsons. Describes methods in common use and shows the advantages of the longwall system. Ills. 3000 w. Eng & Min Jour—Oct. 23, 1909. No. 8723.

I. Notes on Working Thick Coal. II. Brickwork Dams in Thick Coal. Two short papers by Lawrence Holland, with short discussion. 4000 w. Col Guard—Feb. 19, 1909. No. 2891 A.

The Best Methods of Working Seams of Coal in Steep Measures. H. A. Staples. From a prize paper, Lewis Prize Competition, 1908. Ills. 2500 w. Col Guard—March 19, 1909. Serial, 1st part. No. 3613 A.

Avoidable Losses in Mining. H. Morton Middleton. A review of the general causes of the loss of time. 2200 w. Col Guard—May 7, 1909. No. 4723 A.

The Working of the Inclined Seams in the St. Etienne Coalfield, at the Mont-rambert and La Beraudiere Collieries. Hugh Clarkson Annett. Abstract of a paper before the N. of England Inst. of Min. & Mech. Engrs. Describes methods

COAL AND COKE

of working. 2200 w. Ir & Coal Trds Rev—Dec. 18, 1908. No. 1380 A.

Advanced Methods of Mining Coal in Silesia. Lucius W. Mayer. Illustrates and describes a system in which filling is flushed into the workings and total extraction accomplished. 6000 w. Eng & Min Jour—Nov. 7, 1908. No. 145.

Geological Relations and Working of Thin Lignite Seams at Müncheberg, Germany (Ablagerungsverhältnisse und Abbau der geringmächtigen Braunkohlenflöze bei Müncheberg). Dr. Tornow. A brief description of the deposits and mining methods. Ills. 3800 w. Glückauf—April 24, 1909. No. 4873 D.

The Determination of the Net Contents of Loaded Cars (Die Ermittlung des Nettoinhaltes beladener Förderwagen). A. Weise. Describes methods for the purposes of miners' wage determination. Ills. 2500 w. Glückauf—Oct. 3, 1908. No. 553 D.

Boring as a Means of Security Against Irruptions of Gas and Water (Das Vorborenen als Sicherungsmittel gegen Wasser- und Gasdurchbrüche). Herr Stegemann. Describes the practice of exploratory boring followed in some German mines. Ills. 2800 w. Glückauf—May 1, 1909. No. 5756 D.

The Nine Hours Day in Austria. Translation of a report by a Commission appointed by the Belgian Government, in regard to the effect on production, earnings, etc. 2500 w. Col Guard—April 23, 1909. No. 4457 A.

Progress and Improvements in Mining in Austria (Fortschritte und Verbesserungen beim Bergbaubetrieb in Oesterreich). The first part of the serial discusses improvements in hoisting methods and appliances. Ills. Serial, 1st part. 1200 w. Oest Zeit f Berg u Hüttenwesen—Feb. 6, 1909. No. 3366 D.

Some Experiments and Improvements in Mining in Austria (Einige Versuche und Verbesserungen beim Bergbau in Oesterreich). Discusses recent practice in coal mining. Ills. Serial, 1st part. 2500 w. Oest Zeitschr f Berg u Hüttenwesen—Nov. 21, 1908. No. 1149 D.

Lignite Coal Mining in Bohemia. William S. Hall. Describes methods employed in working thick pitching seams. Ills. 2800 w. Mines & Min—Jan., 1909. No. 1412 C.

See also Coal Cutting, under COAL AND COKE; Haulage, Pumping, and Timber Drawing, under MINING; and Eight-Hour Day, under INDUSTRIAL ECONOMY.

MINING AND METALLURGY

Mining Costs

COAL AND COKE

Peat

Mining Costs.

An Investigation of the Cost of Mining Coal. J. R. Finlay. Gives an analysis of operating costs. 4000 w. Eng & Min Jour—May 8, 1909. No 4568.

Mining Finance.

Coal Mining as an Investment. H. M. Chance. Discusses the elements tending to stability and safety, the causes of failures, etc. 2500 w. Eng & Min Jour—Aug. 14, 1909. No. 7070.

Mining Plants.

Power Plant of a Modern Coal Mine in Alabama. Illustrated detailed description of the plant at Marvel, Ala. A steel viaduct, steel tippie with screens and interesting up-to-date equipment. 2500 w. Mfrs' Rec—May 20, 1909. No. 4764.

Re-Sinking and Re-Equipping the Great Western Colliery Company's Maritime Pit. Hugh Bramwell. Read before the S. Wales Inst. of Engrs. Illustrates and describes the work and methods. 5000 w. Ir & Coal Trds Rev—Oct. 23, 1908. No. 81 A.

Montana.

The Great Falls Coalfield in Montana. A. T. Shurick. Describes the deposit, reviewing past and present operations, methods, etc. Ills. 2500 w. Eng & Min Jour—March 20, 1909. No. 3261.

The Coal-Mining Industry of Montana. J. P. Rowe. Illustrated review of various properties and the methods employed. 4000 w. Eng & Min Jour—April 24, 1909. No. 4176.

New Guinea.

Geological Features of the Purari River, Western Papua. P. N. Charpentier. Describes recently discovered coal beds. 1500 w. Aust Min Stand—June 30, 1909. No. 6867 B.

New Mexico.

The Coal Mines and Plant of the Stag Canon Fuel Co., Dawson, N. M. Jo. E. Sheridan. The geography, geology, mining methods, coal-washing plant, coke-ovens, power plant, water-works, etc. Ills. 7000 w. Bul Am Inst of Min Engrs—June, 1909. No. 5850 F.

New Zealand.

Methods of Mining Coal in New Zealand. Sidney Fry. Illustrated detailed description of the Westport-Sockton Colliery, being developed along American lines. 2000 w. Eng & Min Jour—April 10, 1909. No. 3869.

Coal-Mining Methods in New Zealand. Frank Reed. An account of methods of operating, ventilation, prospects, etc. 1500 w. N Z Mines Rec—Dec. 16, 1909. No. 2199 B.

Coal Mining Methods in New Zealand. Frank Reed. Brief description of coal-mining operations, colliery workings, etc. 2000 w. Aust Min Stand—Jan. 13, 1909. No. 2506 B.

Description of a New Zealand Coal Mine. C. J. Holroyde. A general illustrated description of the plant of the Westport Stockton Coal Co.'s mine. 2500 w. Aust Min Stand—Aug. 18, 1909. No. 8141 B.

See also same title, under GOLD AND SILVER.

Oklahoma.

The Coal Resources of Oklahoma. Charles N. Gould. Information in regard to these deposits. 1200 w. Min Wld—Dec. 12, 1908. No. 1033.

Peat.

The Peat Resources of the United States. Charles A. Davis. A summary of their extent and uses. 4500 w. Engineering Magazine—April, 1909. No. 3528 B.

The Gasification of Peat. Charles A. Davis. Deals with the utilization of low-grade fuels, showing that it is possible to obtain gas for power and heating, high-grade coke, and sufficient by-products to pay the cost of operation. 6000 w. Casier's Mag—Aug., 1909. No. 7036 B.

Investigations of the Peat Bogs and Peat Fuel Industry of Canada, 1908. Erik Nyström and S. A. Anrep. Describes the method of investigation, the peat bogs, and the present status of the industry. Ills. 6500 w. Can Dept of Mines—Bul No. 1. No. 30. No 6445 N.

Investigation of the Peat Bogs and Peat Industry of Canada During the Season 1908-9. Erik Nyström and S. A. Anrep. Report of methods of investigation, with description of bogs and discussion of the present status of the peat industry. Maps. 10000 w. Canada Dept of Mines, Bul. No. 1, No. 30. No. 7820 N.

Peat and Lignite. Erik Nyström. A review of their preparation and uses in Europe. Ills. 98500 w. Canada Dept of Mines—1908. No. 7821 N.

Fuel from Peat. Dr. M. Ekenberg. Read before the I. and S. Inst. Researches and experiments with the object of finding a suitable process for converting peat into fuel without air-drying. Ills. 8500 w. Ir & Coal Trds Rev—May 14, 1909. No. 5133 A.

MINING AND METALLURGY

Peat

A New Source of Peat Fuel. Thomas Tomlinson. Discussion of the Ekenberg process and disputing claims advanced in its favor. 2400 w. Elec Rev, Lond—May 28, 1909. No. 5418 A.

Ammonia Sulphate from Peat. Describes the Woltereck Process employed at Carnlough, Ireland, where a mixture of air and water vapor is passed over peat maintained at low heat in special furnaces to evaporate the nitrogenous contents which are then treated to yield ammonium sulphate. Ills. 2000 w. Sci Am Sup.—June 5, 1909. No. 5312.

See also Fuels, under MECHANICAL ENGINEERING, STEAM ENGINEERING.

Pennsylvania.

The Jenner Mine of the Somerset Coal Co. John L. Wagner. Illustrated description of the ring electric coal puncher machines for cutting coal, methods of haulage, etc. 1400 w. Mines & Min—Feb., 1909. No. 2232 C.

Peru.

The Anthracite of Huayday, Otuzco, Peru. Ernesto du B. Lukis. Describes the deposits. 1300 w. Min Jour—May 15, 1909. No. 4956 A.

The Coal of La Libertad, Cajamarca and Ancachs, Peru. Ernesto du Bois Lukis. Abstract translation, describing these coal deposits. 1000 w. Min Jour—Oct. 2, 1909. No. 8475 A.

Philippines.

Philippine Coal-Fields. J. B. Dilworth. Information concerning the coalfields examined. Map. 4000 w. Bul Am Inst of Min Engrs—Jan., 1909. No. 2422 F.

Philippine Coals. Alvin J. Cox. Abstract of a paper in "The Mineral Resources of the Philippine Islands." Gives analyses, steaming tests, and other information. 1200 w. Eng & Min Jour—Nov. 28, 1908. No. 706.

Philippine Coals as Fuel. Alvin J. Cox. Reports an investigation made to determine the steam-making value of the coals of the Philippine Islands, as compared with foreign coals offered on the market. Also a comparative study of the individual coals. Ills. 12600 w. Philippine Jour of Sci—Nov., 1908. No. 2709 N.

The Coal Resources of the Philippine Islands. Warren D. Smith. Considers the importance of the coal supply, the geology, distribution, coal fields, character of the coals. Map. 4000 w. Ec-Geol—April, 1909. No. 4671 D.

See also Calorimetry, under MECHANICAL ENGINEERING, MEASUREMENT.

COAL AND COKE

Production.

Coal Mining in the United States in 1908. Reviews the mining conditions in important anthracite and bituminous centers. 11500 w. Eng & Min Jour—Jan. 9, 1909. No. 1583.

Production of Coal in United States in 1908. E. W. Parker. Summary of statistics of the U. S. Geol. Survey. 4000 w. Min Wld—Aug. 21, 1909. No. 7191.

The Coal and Coke Trades of the United Kingdom in 1908. General and district reviews of the past year. 17500 w. Ir & Coal Trds Rev—Jan. 1, 1909. No. 1721 A.

The World's Coal Production and Consumption. Information from the annual statement of the Board of Trade. 3000 w. Col Guard—Feb. 26, 1909. No. 3062 A.

Prospecting.

Prospecting Anthracite Mines by Drill Holes. Frank Lynde. Describes the systematic methods employed. 3000 w. Eng & Min Jour—Aug. 7, 1909. No. 6943.

Rescue Appliances.

Recent Advances in Means of Saving Life in Coal Mines. Abstract of a lecture by Sir Henry Cunyngham. Describes some of the dangers in mining, and improvements in safety lamps, explosives, and rescue apparatus. 4000 w. Col Guard—Feb. 26, 1909. No. 3060 A.

Rescue Methods, with Special Reference to Underground Rescue Stations, and Recent Disasters (Das Grubenrettungswesen mit besonderer Berücksichtigung von unterirdischen Rettungsstationen und Beziehung auf die jüngsten Katastrophen). J. Mayer. Serial, 1st part. 5200 w. Oest Zeitschr f Berg u Hüttenwesen—Dec. 5, 1908. No. 1947 D.

The History of Breathing Apparatus in Mining (Die Vorgeschichte der Atmungsapparate im Bergbau). Fritz Jüngst. An illustrated review. Serial, 1st part. 6700 w. Glückauf—June 12, 1909. No. 6574 D.

The Criticism of Portable Breathing Appliances in Dr. Ferdinand Hagemann's Book (Zur Kritik Dr. Ingenieur Ferdinand Hagemanns über die freitragbaren Atmungsapparate in seinem Buche "Bergmännisches Rettungs" und Feuerschutzwesen in der Praxis und im Lichte der Bergpolizei-verordnungen Deutschlands und Oesterreichs). A defense of the portable apparatus. Serial, 1st part. 1800 w. Oest Zeitschr f Berg- und Hüttenwesen—July 31, 1909. No. 7270 D.

See also Mine Fires, under COAL AND COKE.

MINING AND METALLURGY

Rescue Stations

Rescue Stations.

The Rescue Station at Frameries, S. Stassart and J. Bolle, in *Ann. des Mines de Belgique*. Illustrated description of the station installed and equipped by the Belgian government. 2000 w. Col Guard—Sept. 10, 1909. No. 7862 A.

Reviews of 1908.

See Production, under COAL AND COKE.

Rhode Island.

Rhode Island Coal for New England? Describes deposits of hard, graphitic coal that is practically incombustible in its natural state, but is said to burn readily after chemical treatment. Ills. 2500 w. Power—Oct. 5, 1909. No. 8321.

Royal Commission Report.

Royal Commission on Mines. Abridgement of the second report. 21000 w. Col Guard—Sept. 17, 1909. Serial. 1st part. No. 8122 A.

Russia.

The Coal Fields of Russia. Dr. Robert Grimshaw. Brief review of the coal deposits and mines. 1000 w. Min Wld—Sept. 4, 1909. No. 7549.

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German Tests with Igniters for Safety Lamps. Bergassessor Beyling, in *Glückauf*. Reports results of experiments carried out at the experinmental colliery, Gelsen-Kirchen. 1200 w. Col Guard—Dec. 24, 1908. No. 1533 A.

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COAL AND COKE

Sampling.

Sampling and Analyzing of Coal. Explains the method used by the U. S. Geol. Survey, which involves a determination of everything that affects heat value. 3000 w. Power—Sept. 21, 1909. No. 7874.

See also Analysis, under COAL AND COKE.

Scotland.

The Clyde Valley Coalfield. David Ferguson. A geological study of the coalfields and deposits of Scotland. 2500 w. Col Guard—April 16, 1909. No. 4199 A.

Screening.

Plant of the Utah Fuel Co. A. C. Watts. Illustrated description of methods and machinery employed for crushing and screening coal at Sunnyside, Utah. 2200 w. Mines & Min—Oct., 1909. No. 8261 C.

Colliery Screening Plant. Arthur Hall. Read before the Nat. Assn. of Col. Mgrs. Describes the general schemes of screening plants, with remarks on things to be adopted or avoided. Ills. 6000 w. Ir & Coal Trds Rev—Feb. 5, 1909. No. 2494 A.

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Seismograph Station.

The Seismograph Station of the Westfalian Coal Company in Bochum (Die Erdbebenstation der Westfälischen Berggewerkschaftskasse in Bochum). L. Mintrop. Detailed description of the station and its equipment. Ills. Serial, 1st part. 3500 w. Glückauf—March 13, 1909. No. 4262 D.

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Weighing Coal, and Legitimate Shrinkage. From a paper before the Int. Fuel Assn. Considers allowable shrinkage, pilfering, weights and scales. 1500 w. R R Age Gaz—Aug. 20, 1909. No. 7171.

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MINING AND METALLURGY

Storage

Storage.

Storage of Coal Under Water and Tests of the Weathering of Coal. Reports results of experiments and tests. 1200 w. Eng News—Dec. 24, 1908. No. 1243.

The Economy of Storing Coal under Water (Die Lagerung von Steinkohle unter Wasser und die Wirtschaftlichkeit dieses Verfahrens). Kurt Seidl. Discusses the deterioration of coal in air and reports researches on the economy of water storage. Ills. Serial. 1st part. 8800 w. Glückauf—Jan. 9, 1909. No. 2676 D.

See also Coal Handling, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING.

Testing Stations.

United States Testing Station at Pittsburgh. Description, with plan and section of the gas and dust gallery. Ills. 4500 w. Col Guard—Aug. 27, 1909. No. 7651 A.

Texas.

Lignite and Its Relation to Other Fuels of the Southwest. A. C. Scott. Describes the extensive deposits of lignite in Texas, and also semi-bituminous fuels and crude ore deposits of the same state, comparing the relative heating power of the three classes of fuels. 3000 w. Elec Wld—Oct. 21, 1909. No. 8809.

United States.

The Coalfields of the United States. Map and estimate tonnage, describing the character of the coals and annual production. 2000 w. Eng & Min Jour—Jan. 16, 1907. No. 1762.

The Coal Fields of the United States. Marius R. Campbell and Edward W. Parker. Gives classification and description, with remarks on duration of supply and waste. 3000 w. Bul Am Inst of Min Engrs—April, 1909. No. 4085 F.

The Coal Mining Industry of the United States in 1908. Condensed from information furnished by the U. S. Geol. Survey. 2000 w. Eng News—Sept. 2, 1909. No. 7542.

Problems of the Coal Industry. Alexander Dempster. Discusses the establishment of a mining bureau, accidents, and related subjects. 3000 w. Pro Am Min Cong—1908. No. 4139 N.

The Coal Resources of the Southern States. Edward W. Parker. Reviews the development of the coal mining industry. 2500 w. Mfrs Rec—Jan. 7, 1909. (Special No.) No. 1561 C.

Fuel in the Intermountain Region. D. Harrington. Read before the Utah Soc.

COAL AND COKE

Washing

of Engrs. A discussion of the distribution of the coal fields. 3500 w. Mines & Min—June, 1909. No. 5240 C.

Valuation.

Pricing Public Coal Lands. Describes the methods of classifying and valuing U. S. Gov't coal lands. 1600 w. Eng & Min Jour—June 5, 1909. No. 5300.

Virginia.

Vast Coal Operations in the Clinchfield Region. William H. Stone. Information concerning the development of this large coal area. Map and illustrations. 4000 w. Mfrs' Rec—July 8, 1909. No. 6218.

Coal Mining in Southwestern Virginia. D. A. Patterson. Illustrated description of a mine equipped with modern devices for economic production. 1500 w. Can Min Jour—July 1, 1909. No. 6116.

Wales.

No. 3 Pit, Bwllfa Colliery. An illustrated description of a modernized plant recently installed. 1700 w. Ir & Coal Trds Rev—Aug. 27, 1909. No. 7665 A.

Washing.

Washing and Coking Tests of Coal at the Fuel-Testing Plant, Denver, Colo., July 1, 1907, to June 30, 1908. A. W. Belden, G. R. Delamater, and J. W. Groves. Describes investigations undertaken by the U. S. Government for the purpose of increasing efficiency in the utilization of the fuel supply. Ills. 9500 w. U S Geol Surv—Bul. 368. No. 3197 N.

Coal Washery Plant Control. G. R. Delamater. Gives results of tests with a new float-and-sink machine compared with former tests. Diagrams. 4000 w. Mines & Min—Aug., 1909. No. 6888 C.

Reclaiming Coal from the Culm Pile. Warren O. Rogers. Illustrated description of the operation of washeries in the anthracite region. 2000 w. Power—June 15, 1909. No. 5495.

The Operation of a Coal Washery in Colorado. W. F. Murray. Describes old and new methods. Ills. 1500 w. Eng & Min Jour—Dec. 26, 1908. No. 1275.

Ernest Coal-Washing Plant. Illustrates and describes recent additions and improvements to this plant, located at Ernest, Pa. 1600 w. Mines & Min—Jan., 1909. No. 1411 C.

A New Coal Washery in Michigan. Lee Fraser. Describes specially designed methods used for coal averaging about 15 per cent ash, and containing a quantity of crystallized pyrites. 800 w. Eng & Min Jour—May 15, 1909. No. 4684.

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Washing

Coal-Washing Jigs. E. J. Munby. Describes the Foust jig and its trial. Ills. 1500 w. *Sci Am Sup*—Nov. 14, 1908. No. 247.

Surface Plant at the Cripplestone Colliery, near Wakefield. Describes the Lührig coal washers and the installation of Otto Hilgenstock Coke Ovens. Ills. 1200 w. *Col Guard*—Jan. 15, 1909. No. 2066 A.

The Cardiff Coal Washery. Illustrated detailed description of the plant and its operation. 4500 w. *Col Guard*—Jan. 29, 1909. No. 2356 A.

Washington.

The Coal Resources of Washington. R. P. Tarr. Describes the geological features and their influence on the quality of coal, extent of development and output. 4500 w. *Mines & Min*—Aug., 1909. No. 6883 C.

Weathering.

See Storage, under COAL AND COKE.

West Virginia.

Coal Fields of West Virginia. H. H. Stoek. The geology of the region with description of the coals, and analyses from different seams. Maps. 3500 w. *Mines & Min*—Dec., 1908. Serial, 1st part. No. 718 C.

Presidential Address. J. B. Hanford. Address before the W. Va. Coal Min. Inst. on conditions affecting the mining busi-

ness. 3000 w. *Mines & Min*—July, 1909. No. 6184 C.

Coal Mining in Central West Virginia. Floyd W. Parsons. Map and illustrated study of conditions and details of operation at the Coalton mine. 3000 w. *Eng & Min Jour*—June 26, 1909. No. 6010.

Coal Fields of Central West Virginia. H. H. Stoek. Gives the history and geology of the region, the seams mined, methods of working, development, etc. Maps and Ills. 4000 w. *Mines & Min*—Oct., 1909. No. 8263 C.

The Kanawha Region, W. Va. H. H. Stoek. Gives information in regard to the location and extent of the region, transportation facilities, output, etc. Ills. 4000 w. *Mines & Min*—Aug., 1909. No. 6886 C.

New River Coal Field, W. Va. H. H. Stoek. Map and illustrated description of the methods of mining, transportation and business organization. 3500 w. *Mines & Min*—June, 1909. No. 5244 C.

Raleigh County Mining Methods. H. H. Stoek. Describes methods in use and proposed in a newly developed region of West Virginia. Ills. 4500 w. *Mines & Min*—May, 1909. No. 4481 C.

The Barren Zone of the Northern Appalachian Coal Field and Its Relation to Pittsburgh's Industries. Dr. I. C. White. Considers the problem of coal shortage and discusses the waste and the remedies. 4000 w. *Pro Am Min Cong*—1908. No. 4131 N.

COPPER

Alaska.

The Big Bonanza Copper Mine, Latouche Island, Alaska. Francis Church Lincoln. History and detailed description of its development. Ills. 2800 w. *Ec-Geol*—April, 1909. No. 4669 D.

Mineral Resources of Kotsina-Chitina Region. Fred H. Moffit and A. G. Madden. Abstract from Bul. 374, U. S. Geol. Surv. Describes the geography and gives the history of this copper region. 2500 w. *Min Wld*—July 17, 1909. No. 6410.

Mining on Prince of Wales Island, Alaska. W. A. Scott. An illustrated account of copper mines yielding some gold. 1600 w. *Min & Sci Pr*—June 26, 1909. No. 6058.

Copper Mining on Prince William Sound, Alaska. U. S. Grant and D. F. Higgins, Jr. Abstract from Bul. 379, U. S. Geol. Survey. Gives brief descriptions

of properties being developed. Map. 4500 w. *Min Wld*—July 31, 1909. No. 6801.

See also same title, under RAILWAY ENGINEERING, MISCELLANY.

Alloys.

The Influence of Bismuth on Wire-Bar Copper. H. N. Lawrie. Reviews the conclusions of other investigators and reports the author's tests and conclusions. 3000 w. *Bul Am Inst of Min Engrs*—Sept., 1909. No. 8197 F.

Analysis.

The Precipitation of Copper Oxalate in Analysis. F. A. Gooch and H. L. Ward. An account of the experimental study of conditions under which small as well as large amounts of copper may be determined by the oxalate method. 2200 w. *Am Jour of Sci*—June, 1909. No. 5543 D.

Anode Casting

Anode Casting.

Walker Patent Casting Wheel. Illustrated description of the large wheel installed at Port Kemble (N.S.W.) 1200 w. Aust Min Stand—July 7, 1909. No. 7130 B.

Arizona.

Historical Résumé of the Copper Queen Mine. Synopsis of an address delivered at Bisbee by Dr. James Douglas, giving the early struggles of this valuable mine. 2500 w. Eng & Min Jour—Feb. 20, 1909. No. 2559.

The Copper Creek Mining District, Arizona. R. Roy Sibley. Map, plans, and information in regard to this new and promising copper mining district. 1500 w. Min Wld—March 13, 1909. No. 3125.

Mining in Western Arizona and Eastern California. W. A. Root. Map and illustrated description of properties in this region. The prevailing mineral is copper carrying gold values. 1500 w. Min Wld—May 15, 1909. No. 4700.

Ray Copper District, Arizona. William H. Truesdell. Describes the local geology of this copper-producing district. Ills. 3500 w. Min & Sci Pr—June 5, 1909. No. 5509.

Ray Consolidated Mines. R. L. Herrick. Illustrates and describes a low-grade copper property at Ray, Ariz. 5000 w. Mines & Min—July, 1909. No. 6182 C.

The Southern Arizona Copper Fields. C. F. Tolman, Jr. Describes the occurrences and their relation to the local geology, and the mining methods. Ills. 3600 w. Min & Sci Pr—Sept. 11, 1909. No. 7831.

The Miami Copper Mine, Arizona. R. L. Herrick. Illustrates and describes the mine development and mining methods. Creosoted timbers are used in shafts and drifts. 5800 w. Mines & Min—Sept., 1909. No. 7490 C.

Assaying.

Determination of Copper in Ores, Mattes, Etc. Richard K. Meade. Describes the three methods in common use—the electrolytic, the iodine, and the cyanide. Ills. 3000 w. Min Wld—June 26, 1909. No. 6005.

Accuracy in Assays and Analyses. James W. Howsör. Gives tabulated results in duplicate of most of the elements usually determined in ore analyses, with information relating to analytical work. 1500 w. Min & Sci Pr—Sept. 4, 1909. No. 7691.

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Australia

A New Volumetric Method for the Determination of Copper (Nuevo Método de Dosaje Volumétrico del Cobre). Juan A. Sánchez. Describes the author's newly devised method. 3000 w. Anales d l Soc Cien Argentina—Jan., 1909. No. 7250 E + F.

See also Mine Sampling, under MINING.

Australia.

Methods of Copper Mining. H. Lipson Hancock. Compares Australia with America and Europe. 1800 w. Aust Min Stand—March 17, 1907. No. 4187 B.

The Mining Industry in Queensland. Gerard W. Williams. Describes the copper-lead-silver mines near Chillagoe and the smelting methods. 4000 w. Eng & Min Jour—March 20, 1909. No. 3265.

Queensland's Great Copper Field. John Plummer. Information concerning the Cloncurry field. 1200 w. Min Wld—March 6, 1909. No. 3020.

The Mount Morgan Gold and Copper Mine. Gerard W. Williams. Illustrated description of the deposits, methods of mining and milling. 2500 w. Eng & Min Jour—March 27, 1909. No. 3531.

Copper Mines in Chillagoe District, Queensland. Gerard W. Williams. Describes some of the isolated copper properties in Northeastern Australia, where small scale smelting operations are carried on. Ills. 1150 w. Eng & Min Jour—June 5, 1909. No. 5295.

The Cloncurry Copper District, Queensland. Gerard W. Williams. An illustrated account of a highly-mineralized but inaccessible region, where fuel and timber are scarce. 5000 w. Eng & Min Jour—July 24, 1909. No. 6640.

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Recent Mineral Discoveries, Northern Territory. H. Y. L. Brown. An account of discoveries of copper ores, carrying gold, silver and some lead, arsenic, etc. 4000 w. Aust Min Stand—Jan. 20, 27, 1909. Serial, 2 parts. No. 3044 each B.

Gold and Copper Deposits, Phillips River (W. A.). H. P. Woodward. A detailed description of these ore deposits. 2000 w. Aust Min Stand—Aug. 11, 1909. Serial. 1st part. No. 8006 B.

Mt. Malcolm Copper Mine. Mt. Margaret Goldfield (W. A.) H. P. Woodward. Reviews the history of this mine and its

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Austria

development. 2500 w. Aust Min Stand—May 12, 1909. No. 5823 B.

See also same title, under COAL AND COKE; under GOLD AND SILVER.

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The Value of the Schneeberg Deposits (Die Bauwürdigkeit der Schneeberger Lagerstätten). B. Granigg. A discussion of the economy of further working of these zinc-lead-copper deposits in the Austrian Tyrol. Ills. Serial. 1st part. 4500 w. Oest Zeitschr f Berg u Hüttenwesen—Oct. 24, 1908. No. 551 D.

Blast Furnace Charges.

Blast Furnace Charge Calculator. Describes a circular rule, designed by R. Marshall, for enabling the smelter of copper to calculate the various quantities of fluxes for any given weight of charge. 800 w. Engr, Lond—Jan. 8, 1909. No. 1828 A.

Blast Furnace Gases

Power from Copper Blast-Furnace Gases. Robert Schorr. Information concerning the furnaces at Mansfeld, Germany, and their operation. They yield gas for power equivalent to 7.4 h.p. per ton of ore treated. 2000 w. Eng & Min Jour—Feb. 27, 1909. No. 2864.

Blast Furnaces.

A Hot-Blast Furnace for the Small Operator. Percy Andrus Babb. Illustrated detailed description of the New Model hot-blast furnace and its working. 2500 w. Eng & Min Jour—Oct. 2, 1909. No. 8267.

New Copper Blast Furnaces at Teziutlan Smeltery. Cyrus Robinson. Drawings and description of construction in which no brickwork is used. Each furnace is charged mechanically at five points. 500 w. Eng & Min Jour—Oct. 2, 1909. No. 8269.

Blast Furnace Practice in High Altitudes. R. R. Lloyd. Deals with the construction of blast furnaces in high altitudes, and the modification of general practice to suit the conditions. 1800 w. Cal Jour of Tech—Oct., 1909. No. 8761.

Blowers.

The Rotary Blower in Smelting Works. George C. Hicks, Jr. Explains the principles of operation and the essentials of success. Ills. 3000 w. Eng & Min Jour—Feb. 13, 1909. No. 2466.

Briquetting.

See same title, under ORE DRESSING AND CONCENTRATION.

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British Columbia.

Methods of Mining the Granby Orebodies. C. M. Campbell. Explains the nature of the deposit, scheme of operations, etc. Little timbering is required, and electric power is used. Ills. 4000 w. Eng & Min Jour—Jan. 30, 1909. No. 2174.

Mining on the Queen Charlotte Islands. B. C. J. F. Bledsoe. An illustrated article giving information in regard to copper deposits of value. 2000 w. Min Wld—March 20, 1909. No. 3436.

Mining Methods and Equipment at the British Columbia Copper Company's Mother Lode Mine. M. D. McIntosh. Read before the Can. Min. Inst. A brief description of the system. 1000 w. Can

The Importance of Low Grade Boundary Ores in the Copper Production of Canada. A. B. W. Hodges. Information concerning these ores and their treatment. General discussion. 4500 w. Bul Can Min Inst—Jan., 1909. No. 2043 N.

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The Balaklala Consolidated Copper Company. Abstract of an official report giving a statement of the general conditions and summaries of mine and smelter operations for 1908. Ills. 1500 w. Eng & Min Jour—March 6, 1909. No. 2980.

The Mammoth Mine and Smelter in California. Al. H. Martin. Describes these ore deposits on the west side of the Sacramento River, running from 3 to 12% copper and from \$1.50 to \$3 in gold and silver, and their treatment. Ills. 1000 w. Min Wld—Aug. 7, 1909. No. 6933.

Copper Mines and Smelteries of Shasta County. George A. Packard. Illustrated description of the Mammoth mine and smelter at Kenneth, Cal., and other adjacent mines. 5500 w. Eng & Min Jour—Aug. 28, 1909. No. 7388.

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Some Recollections of Early Copper Mining in Canada. Dr. James Douglas. Brief review. 1500 w. Can Min Jour—Feb. 1, 1909. No. 2293.

Chile.

Conditions and Costs of Mining at the Braden Copper Mines, Chile. William Braden. An explanation of the general conditions, operating costs, etc. 1000 w. Bul Am Inst of Min Engrs—Oct., 1909. No. 8742 F.

Colorado.

Some Copper Deposits in the Sangre de Christo Range, Colorado. Rufus Mather

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Converters

Bagg, Jr. Describes the geology of this range and discusses the probable origin of the deposits. Ills. 3000 w. *Ec-Geol*—Dec., 1908. No. 1878 D.

Converters.

Modern Type of the Barrel Copper Converters. Charles F. Shelby. Illustrated description of the design. 1000 w. *Eng & Min Jour*—Oct. 23, 1909. No. 8725.

Costs.

Calumet & Hecla Costs. L. S. Austin. Information taken from testimony given in a suit in 1907. 1500 w. *Min & Sci Pr*—Dec. 19, 1908. Serial, 1st part. No. 1262.

Electro-Metallurgy.

Improvements in the Construction and Manufacture of Parabolic Reflectors. Sherard Cowper-Coles. Describes an electrolytic process for making metallic reflectors. Ills. 4500 w. *Engng*—Oct. 23, 1908. No. 78 A.

Recent Advances in the Electrometallurgy of Copper (Neuerungen auf dem Gebiete der Elektrometallurgie des Kupfers). Dr. Franz Peters. Discusses electrothermic methods of smelting and electrolytic refining. 3500 w. *Glückauf*—April 10, 1909. No. 4870 D.

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A New Process for Reducing Copper. O. Froelich. Condensed translation from *Elektrochemische Zeit.* Gives a new method for all grades of ores, which can be applied at the mine. 2000 w. *Sci Am Sup*—March 27, 1909. No. 3583.

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Mansfield Electrically Operated Copper Mines. Frank C. Perkins. Illustrated description of German mines where furnace gases are utilized for generating electric power. 2200 w. *Min Wld*—Dec. 26, 1908. Serial, 1st part. No. 1254.

Vein Deposits at Lauterberg in the Harz Mountains (Die Kupfererzgänge bei Lauterberg am Harz). Dr. Fleck. Description of these copper ores. Ills. 4500 w. *Glückauf*—July 24, 1909. No. 7276 D.

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Developments of British Copper Mining. H. L. Terry. Reviews recent development work in various districts. 1500 w. *Min Jour*—May 22, 1909. No. 5194 A.

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Snowstorm Copper Deposits. Abstract of Paper 62, U. S. Geol. Survey, by F. L. Ransome and F. C. Calkins. Describes the deposits of this productive

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mine in Idaho. 1000 w. *Min & Sci Pr*—Nov. 21, 1908. No. 623.

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The Copper Mines of Jamaica, British West Indies. Alexander E. Outerbridge, Jr. Illustrated account based mainly on personal observation. 1800 w. *Engineering Magazine*—Aug, 1909. No. 6752 B.

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The Kosan Mine, Korea. A. D. Weigall. Brief account of this copper mine. 1200 w. *Min & Sci Pr*—Dec. 26, 1908. No. 1445.

Lake Superior.

The Localization of Values in Ore Bodies and the Occurrence of Chutes in Metalliferous Deposits. Edwin E. Chase. Comments on a specimen boulder from the Calumet and Hecla conglomerate, and its bearing on the distribution of copper in the Lake Superior copper lodes. 4500 w. *Ec-Geol*—March, 1909. No. 3257 D.

See also Smelting, under COPPER.

Matte Cars.

The Kilker Matte Tapping Car. F. T. Harvard. Illustrated description of a machine which makes possible a saving in the working costs of a smelting plant. 900 w. *Eng & Min Jour*—June 26, 1909. No. 6011.

Mattes.

The Constitution of Copper-Iron and Copper-Lead-Iron Mattes. Charles H. Fulton and Ivan E. Goodner. Determines, by metallographic and chemical means, the constitution of the mattes named. Ills. 8500 w. *Bul Am Inst of Min Engrs*—Nov., 1908. No. 685 C.

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The Cananea Consolidated Copper Co. in 1908. L. D. Ricketts. Report of operations, development work, etc. 6000 w. *Eng & Min Jour*—April 3, 1909. No. 3726.

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Puebla. Describes especially the Teziutlan Copper Co.'s mines and smelter. Ills. 2500 w. *Min Wld*—July 3, 1909. No. 6157.

MINING AND METALLURGY

Michigan

Mines and Works of the Rio Tinto Copper Co. H. J. Baron. Illustrated description of this mining plant at Terrazas, Mexico, showing what is accomplished by American methods, and the profitable operation of the small copper smelter—3500 w. *Min Wld*—Oct. 2, 1909. No. 8310.

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Michigan.

Geology of the Porcupine Mountains, Michigan. Alfred C. Lane. Maps and description of the practice by which 750 tons of copper is recovered monthly. Ills. 1800 w. *Min Wld*—June 12, 1909. No. 5482.

Mine Waters.

The Precipitation of Copper from Butte Mine Water. Charles J. Stone. A description of the practice by which 750 tons of copper is recovered monthly. Ills. 1800 w. *Eng & Min Jour*—May 8, 1909. No. 5082.

Nevada.

Copper Mining at Ely, Nevada. Courtenay DeKalb. Gives the history of this important district, the geology, method of mining, etc. Ills. 2500 w. *Min & Sci Pr*—Jan. 2, 1909. No. 1635.

The Nevada-Douglas Copper Properties, Nev. W. S. Zehring. Illustrates and describes the geology of this mining district. 1800 w. *Min Wld*—April 17, 1909. No. 4021.

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The Yerrington Copper Deposits. Frederick Leslie Ransome. Abstract of Bul. No. 380-B, U. S. Geol. Surv. Explains the distribution of the mines, classifies the deposits and describes some of the mines. Map. 4000 w. *Mines & Min*—Sept., 1909. No. 7491 C.

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New Mexico.

Mining and Milling Near Silver City, New Mex. Robert B. Brinsmade. Illustrated description of the development of a district producing gold, silver, copper, lead and zinc. 3500 w. *Min Wld*—Dec. 26, 1908. No. 1257.

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Ore Reduction at the Telemarken Copper Mine, Norway. W. E. Bennett. Illustrated description of a concentrating plant using the vacuum process direct without

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intermediary treatment. 1600 w. *Min Jour*—March 13, 1909. No. 3415 A.

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Property of the Lake Copper Mining Co., Limited, at Copper Lake, Antigonish, N. S. John W. McLeod. Illustrated detailed description of this property and its development. 2000 w. *Can Engr*—April 16, 1909. No. 3994.

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Canadian Copper Company. D. F. Browne. Plan and description of a new concrete building. 3500 w. *Can Min Jour*—Jan. 15, 1909. No. 1835.

Ore Bedding.

Cananea Ore-Bedding System. R. L. Herrick. An illustrated article describing the method of mechanically making up ore beds and charging ore from them into furnaces. 4500 w. *Mines & Min*—Sept., 1909. No. 7487 C.

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The Newark Copper Deposits of Southeastern Pennsylvania. Edgar T. Wherry. A study of these deposits, giving the history, geology and description. Map. 4000 w. *Ec-Geol*—Dec., 1908. No. 1877 D.

Peru.

The Mineral Resources of the Department of Apurimac, Peru. A. Jochamowitz. Reports of various districts, where copper, silver and gold are found. 4500 w. *Min Jour*—Nov. 7, 1908. No. 321 A.

Mining in Morococha, Province of Yauli, Peru. Alberto Jochamowitz. Describes the geology and metalliferous deposits, showing important values in copper and silver. 2200 w. *Min Jour*—May 22, 1909. No. 5193 A.

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MINING AND METALLURGY

Pyritic Smelting

Pyritic Smelting.

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Trade

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Amalgamation

Illustrated description of the mines and methods. 3500 w. *Bul Am Inst of Min Engrs*—Nov., 1908. No. 1064 C.

Mining and Smelting in the Ducktown District. Edwin Higgins. Copper and sulphuric acid produced from ore averaging 2 per cent. copper. Ills. 2500 w. *Eng & Min Jour*—Dec. 26, 1908. No. 1273.

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Australia

Electrochemical Amalgamation and Lixiviation. Elmer Ellsworth Carey. Calls attention to improvements that can be made by employing electrochemical action in connection with lixiviation and amalgamation of gold ores. 2200 w. Min Wld—April 17, 1909. No. 4018.

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The Salt Lake, Utah, Government Assay Office. Leroy A. Palmer. Illustrated description of the methods and equipment. 1500 w. Min Wld—April 24, 1909. No. 4179.

Assay of Cyanide Precipitate. Frank A. Bird. Describes methods of assaying the precipitate as carried out in the Salt Lake district. 1200 w. Min & Sci Pr—Oct. 9, 1909. No. 8737.

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Bohemia

The Black Range District of Western Australia. J. Bowie Wilson. An illustrated account of a new goldfield which has developed quite rapidly and promises to become important. 2500 w. Eng & Min Jour—Oct. 9, 1909. No. 8424.

Deep Mining at Kalgoorlie, Western Australia. Percy Ifould. Discusses the prospects and possibilities. Ills. 2000 w. Aust Min Stand—Nov. 18, 1908. No. 1091 B.

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Dry Chlorine Processes. F. W. Trap-hagen. Explains methods used for the chlorination of complex ores containing precious metals, with zinc, lead, and iron. 4000 w. Mines & Min—May, 1909. No. 4479 C.

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The Present Position of Cobalt, Ontario. Harold P. Davis. Gives statistics of production and shipment. Ills. 800 w. Eng & Min Jour—Oct. 31, 1908. No. 17.

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Cyaniding

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The Coeur d'Alene Mining District, Idaho. J. P. Rowe. Reviews the history and describes the methods of mining. Ills. 1600 w. Min Wld—Nov. 14, 1908. Serial. 1st part. No. 278.

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Oaxaca. Paul Wooton. A report of present conditions of the mining industry, work in progress, railroad facilities, etc. Also *The Geology of Oaxaca*, by A. E. Place. Ills. 7000 w. *Min Wld*—July 3, 1909. No. 6150.

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The Velardena District. J. E. Spurr and G. H. Garrey. Describes this district, its mines and silver-lead-sulphide ores. 1200 w. *Min Wld*—July 3, 1909. No. 6148.

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Hidalgo. The state has vast mineral wealth, which has been mined since 1519. Illustrates and describes some of the mines. 3500 w. *Min Wld*—July 3, 1909. No. 6159.

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Progress on the Comstock Lode. R. L. Herrick. Reviews the history and difficulties that caused the shutting down, and the events that led to the reopening. Ills. 7000 w. *Mines & Min*—Nov., 1908. No. 31 C.

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Impressions of a New Ontario Camp—Gowganda. H. E. West. Describes the deposits, and considers railroad connections essential to their development. 3000 w. *Eng & Min Jour*—May 1, 1909. No. 4385.

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Panning Standards.

The Use of Standards in Reading Gold Pannings. Stephen J. Lett. Describes

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standards made and used by the writer. 2200 w. *Inst of Min & Met*, Bul 56—May 13, 1909. No. 5603 N.

Patio Process.

History and Development of the Patio Process. C. Perez Duarte. An illustrated review, with a study of the reactions. 4000 w. *Min Wld*—July 3, 1909. No. 6137.

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Peru.

The Goldfields of Eastern Peru and Bolivia. Sir W. Martin Conway. Map and description, with general discussion. 8000 w. *Jour Soc of Arts*—Nov. 27, 1908. No. 848 A.

See also Hydraulic Mining, under GOLD AND SILVER; and Peru, under COPPER.

Placers.

Nature of Gold in Alluvials. F. Lynwood Garrison. Gives facts observed in connection with the study of alluvial gold deposits, and discusses influences that have affected the gold accretion. 3000 w. *Min & Sci Pr*—May 29, 1909. No. 5207.

Some Ore Deposits Connected with Placers. Matt. W. Alderson. Describes peculiarities of ore deposits that are often misleading. 2500 w. *Min Wld*—July 24, 1909. No. 6658.

Placer Examinations. Arthur Lakes, Jr. Explains method of prospecting with churn drills, collecting and panning samples, estimating and recording results. 3000 w. *Mines & Min*—July; 1909. No. 6181 C.

Placer Mining Industry on the Pacific Coast. Dennis H. Stovall. Illustrated description of the district and report of output. 700 w. *Min Wld*—April 17, 1909. No. 4020.

Notes on Manhattan Placers, Nye County, Nev. Charles Coleock Jones. Notes on the formation, ore deposits and related subjects. Ills. 2000 w. *Eng & Min Jour*—July 17, 1909. No. 6388.

Mining Methods in the North. T. A. Rickard. Traces the evolution of methods of mining gold-bearing gravel in Alaska. Ills. 3000 w. *Min & Sci Pr*—Dec. 12, 1908. Serial, 1st part. No. 1067.

Placer Gold Mining in Interior Alaska. Information concerning conditions, methods, and prospecting. 4000 w. *Eng & Min Jour*—March 20, 1909. No. 3262.

The Placer Mining Industry of North Carolina. R. Kemp Welch. Reviews the history of the industry and gives information in regard to mines now being worked. Ills. 2500 w. *Min Wld*—May 22, 1909. No. 4934.

See also Prospecting, under MINING; and Alaska, under GOLD AND SILVER.

Precipitation.

Zinc-Box White Precipitates. Roy F. Coolidge. Gives analyses of two kinds of white precipitate, and discusses the causes of the formation. 1600 w. *Min & Sci Pr*—Sept. 18, 1909. No. 8034.

Notes on Precipitation. Mather Smith. A critical discussion of methods, aiming to show that more zinc than is necessary is used and is both harmful and costly; and that precipitation boxes are often constructed on a wrong principle. 2500 w. *Jour Chem, Met & Min Soc of S Africa*—March, 1909. No. 4974 E.

Production.

Gold, Silver and Platinum in 1908. A review of the influences and commercial conditions which governed the production and prices. 3000 w. *Eng & Min Jour*—Jan. 9, 1907. No. 1579.

Quebec.

Riviere Du Loup Goldfields—Townships of Jersey and Liniere, Beauce County, Quebec. Notes and extracts from a report by Dr. Henry Youle Hind, published in 1864. 1200 w. *Can Min Jour*—Oct. 15, 1909. Serial. 1st part. No. 8797.

Rand.

The Origin of the Gold of the Rand Goldfield. John W. Gregory. Summary of a paper read and discussed before the *Inst. of Min. & Met.* Examines the theories advanced. Ills. 3500 w. *Ec-Geol*—March, 1909. No. 3254 D.

The Origin of the Rand Gold Fields. G. A. Denny. Discussion in connection with Prof. Gregory's paper. 5000 w. *Ec-Geol*—Aug., 1909. No. 7889 D.

Interesting Study of the Transvaal Ore Deposits. Etienne A. Ritter. Briefly explains the geology and petrography, giving the four hypotheses advanced to account for the deposition of the gold. 1200 w. *Min Wld*—March 13, 1909. No. 3127.

Notes on Rand Mining. Tom Johnson. Reply to discussion of paper on this subject by the author. 13000 w. *Jour Chem, Met & Min Soc of S Africa*—Sept., 1908. No. 177 E.

President's Valedictory Address. E. J. Laschinger. Discusses the engineering and industrial progress of South Africa, espe-

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Rand

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cially the gold-mining industry. 7500 w. Jour S African Assn of Engrs—July, 1909. No. 7636 F.

The Distribution of the Gold Produced on the Rand. T. Kirke Rose. Statistics of the first rough distribution of the gold produced in South Africa. 2500 w. Jour Chem, Met & Min Soc of S Africa—Feb., 1909. No. 4023 E.

Amalgamation of Four Large Rand Producers. Ralph Stokes. Explains the proposed scheme, giving short descriptions of the mines included in the amalgamation. Plan. 1200 w. Min Wld—April 3, 1909. No. 3745.

The Robinson Mine. J. B. Pritchford. A report of the most productive gold mine in the world at the present time. 2200 w. Min & Sci Pr—Oct. 31, 1908. No. 113.

Rand Mine Waters. F. W. Watson. Deals with waters for drinking and domestic uses, and for industrial purposes, especially for boiler feed supply. Also discussion. 7000 w. Jour S African Assn of Engrs—Sept., 1908. No. 60 F.

See also Labor, and Valuation, under MINING; and United States, under MISCELLANY.

Refining.

Apparatus for Electrolytic Refining of Precious Metals. H. Lacroix. Illustrated description of an improved electrolytic refining apparatus and its operation. 1800 w. Elec-Chem & Met Ind—March, 1909. No. 2982 C.

Rhodesia.

Small Mines of Rhodesia. B. I. Collings. Describes the nature of the ore bodies, the economic and industrial peculiarities of the country, and their effect on the methods of mining and milling adopted. 5000 w. Jour Chem, Met & Min Soc of S Africa—Sept., 1908. No. 176 E.

Gatooma, a Rich Rhodesian Field. Owen Letcher. Describes a promising small mine area. 800 w. Min Wld—July 17, 1909. Serial, 1st part. No. 6409.

See also Gold Milling, under ORE DRESSING AND CONCENTRATION.

Siberia.

Mining in Siberia. Chester W. Purington. Information concerning the Siberian goldfields, and the copper and silver-lead deposits. 1500 w. Min & Sci Pr—Feb. 13, 1909. No. 2535.

Gold and Other Minerals of Eastern Siberia. S. F. G. White. Reports rich gold

quartz veins in Backal; placer deposits in Amurski Oblast. 2000 w. Eng & Min Jour—May 22, 1909. No. 4918.

Gold Dredging in Siberia. J. B. Landfield. Discusses some of the reasons why these placers have not proved profitable. Ills. 2000 w. Min & Sci Pr—Sept. 25, 1909. No. 8226.

Silver Refining.

See Refining, under COPPER.

Tasmania.

The Lisle Goldfield, Tasmania. W. H. Twelvetreets. Specially considering the sources of the alluvial gold. 1600 w. Aust Min Stand—Oct. 14, 1908. No. 463 B.

The Magnet Silver Mining Company, N. L., Tasmania. E. A. de Lautour. Illustrated description of this property and its development. 1200 w. Aust Min Stand—Nov. 25, 1909. No. 1688 B.

King Island, North-West Coast, Tasmania. Donald Clark. Describes features of the country, and mineral deposits of gold and tin oxide. 1000 w. Aust Min Stand—March 10, 1909. Serial, 1st part. No. 4186 B.

Texas.

The Presidio Silver Mines, Shafter, Texas. Morris P. Kirk. Illustrated article giving the situation and history of the mine, occurrence and nature of the ore and the mining operations. 1200 w. Eng & Min Jour—Oct. 23, 1909. No. 8726.

Tierra del Fuego.

The Gold Regions of the Strait of Magellan and Tierra del Fuego. R. A. F. Penrose, Jr. A general account of the occurrence of gold in this little-known region. Ills. 3500 w. Jour of Geol—Nov.-Dec., 1908. No. 1731 D.

Transvaal.

The Pilgrim's Rest Gold Fields and Mining Methods. J. Moyle-Phillips. Illustrates and describes the geology and methods of development, giving the history of these mines. 6000 w. Jour Chem, Met, & Min Soc of S Africa—March, 1909. No. 4973 E.

Utah.

Properties of the Silver King Coalition Co., Utah. Duncan MacVichie. History and illustrated description, from the last annual report. 3000 w. Min Wld—March 6, 1909. No. 3017.

Wales.

See same title, under LEAD AND ZINC.

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Washington

GOLD AND SILVER

Analysis

Washington.

Developments in the Orient District, Washington. Bert N. Sharpe. An illustrated account of this district which yields ores carrying gold, silver and copper. 1200 w. *Min Wld*—May 8, 1909. No. 4581.

West Africa.

West Africa Goldfields at the Close of 1908. Examines the causes of the recent revival and discusses the future prospects of this field. 3500 w. *Min Jour*—Jan. 9, 1909. No. 1816 A.

Wyoming.

The South Pass Gold Mining District, Wyoming. Henry C. Beeler. History of the early mining and development, describing the ores and treatment. 3500 w. *Min Wld*—Dec. 26, 1908. No. 1256.

Yukon.

Hydraulic Mining in the Yukon. R. E. W. Hagarty. Describes methods used. 4000 w. *Can Engr*—Nov. 6, 1908. No. 155.

See also Alaska, and Hydraulic Mining, under GOLD AND SILVER.

IRON AND STEEL

Alabama.

The Clinton Iron-Ore Deposits in Alabama. Ernest F. Burchard. Gives an outline of the geologic relations of the ores, describing particularly the ore of the Birmingham district, and discussing its relations and probable extent. Ills. 1600 w. *Bul Am Inst of Min Engrs*—Nov., 1908. No. 686 D.

Iron Operations of the Birmingham District. Edwin Higgins. Describes the deposits and the methods of mining, the smelting, and the economic and industrial conditions. Ills. 4000 w. *Eng & Min Jour*—Nov. 28, 1908. No. 704.

Economic Features of the Birmingham District. John Leggett Pultz. Reviews the features that have been the principal cause of the rapid industrial growth of this district. Ills. 4500 w. *Eng & Min Jour*—Aug. 14, 1909. No. 7068.

Operating Companies of the Birmingham District. John Leggett Pultz. An account of the furnaces and steel plants of this district, the output and the prospects. Ills. 3500 w. *Eng & Min Jour*—Aug. 21, 1909. No. 7182.

Iron Operations in Northeastern Alabama. Edwin Higgins. Illustrated description of practice in mining the thin red-ore seams and brown-ore banks, and of features of iron blast-furnace operation. 2500 w. *Eng & Min Jour*—Dec. 5, 1908. No. 824.

The Gray Ores of Talladega County, Ala. John Jermain Porter. Information concerning the iron resources of the state, describing the character of the ores, and the condition of the iron industry. 2500 w. *Mfrs Rec*—Sept. 16, 1909. No. 7763.

Analysis.

Determining Carbon in Steel. Warren I. Keeler. Illustrated description of a suc-

cessful direct combustion apparatus, unsurpassed for speed and accuracy. 2500 w. *Ir Age*—July 22, 1909. No. 6604.

Note on the Determination of Carbon and Phosphorus in Steel. Andrew A. Blair. Read before the I. and S. Inst. Supplementary to a report presented in 1904. Shows the accuracy of methods used when proper care is taken. 2000 w. *Ir & Coal Trds Rev*—May 14, 1909. No. 5138 A.

The Standardization of Potassium Permanganate Solution and Its Subsequent Use in Titrating Iron. Cornelis Offerhaus and Ernest H. Fischer. An account of the writers' experience with standards for this solution. 1200 w. *Sch of Mines Qr*—Nov., 1908. No. 975 D.

A Rapid Method for the Analysis of Tin and Terne Plate. R. S. Hiltner, in *West. Chem. & Met.* Gives specifications and methods of analysis, with details of the recommended method. 2500 w. *Min Jour*—Dec. 12, 1908. No. 1204 A.

The Application of the Rothe Process to the Analysis of Iron Minerals and Iron Products (Application du Procédé Rothe à l'Analyse des Minerais de Fer et des Produits sidérurgiques). L. Campredon. Read before the Congress of Applied Chemistry. 1200 w. *Rev de Métal*—June, 1909. No. 6521 E + F.

Check Analyses of Iron Ore (Schiedsanalysen). Discusses several examples of lack of correspondence in ore analyses made in different laboratories. 2500 w. *Stahl u Eisen*—June 9, 1909. No. 6563 D.

The Analysis of Chrome-Tungsten Steel (Zur Analyse von Chrom-Wolfram-Stahl). F. W. Hinrichsen and Th. Dieckmann. Results of test at the Imperial Testing Bureau in Germany. Ills. 2300

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Assaying

w. Stahl u Eisen—Aug. 18, 1909. No. 7955 D.

See also Assaying, under COPPER; and Hardness, under MECHANICAL ENGINEERING, MEASUREMENT.

Assaying.

Methods for the Determination of Iron in Ores. Richard K. Meade. Gives three methods of analysis in use many years in the laboratory of the writer. 4000 w. Min Wld—March 27, 1909. No. 3543.

Preliminary Tests from the Open Hearth Steel Furnace. C. W. Danforth. Read before the Pittsburg Sec. of the Am. Chem. Soc. Shows how speed and accuracy may be attained in laboratory practice. 3000 w. Ir Age—April 8, 1909. No. 3821.

Australia.

Iron Ores and Iron Production in Australia. J. Findlay. A review of the deposits in the different states and the extent of their development. 2500 w. Ir Trd Rev—Jan. 7, 1909. No. 1605.

Australian Iron and Steel Production. John Plummer. Discussion of the use of iron and steel scrap in connection with the bounty on the making of Australian iron and steel. 750 w. Min Wld—June 5, 1909. No. 5377.

Austria.

The History of Iron in the Interior of Austria (Zur Geschichte des Eisens in Inner-Oesterreich). L. Beck. A brief general review. Serial, 1st part. 5300 w. Stahl u Eisen—March 10, 1909. No. 4250 D.

Bessemer Process.

The Basic Bessemer Process. Abstract translation from *Stahl und Eisen* of results of an exhaustive chemical investigation by German engineers. 2800 w. Ir Age—March 18, 1909. No. 3213.

Experimental Researches on the Basic Bessemer Process (Experimentelle Untersuchung des Thomasprozesses). A review of extensive researches giving results. Ills. 8200 w. Stahl u Eisen—Jan. 27, 1909. No. 2665 D.

Thirty Years of the Basic Bessemer Process in Germany (30 Jahre Thomasverfahren in Deutschland). A historical review. Ills. 17000 w. Stahl u Eisen—Sept. 22, 1909. No. 8655 D.

The New Basic-Bessemer Steel Plant at the Burbach Works. F. Schröder, in *Stahl und Eisen*. Illustrated detailed description of the plant and its equipment.

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2500 w. Ir & Coal Trds Rev—Dec. 11, 1908. Serial, 1st part. No. 1224 A.

The Basic Bessemer Plant at the Burbach Works (Das neue Thomasstahlwerk der Burbacher Hütte). F. Schroeder. Illustrated description. Plates. 11000 w. Stahl u Eisen—Nov. 11, 1908. No. 1142 D.

The New Basic Bessemer Plant at the Burbach Ironworks (Das neue Thomasstahlwerk der Burbacher Hütte). F. Schroeder. Illustrated detailed description. Serial, 1st part. 2000 w. Giesserei-Zeit—Jan. 1, 1909. No. 2682 D.

The New Basic Bessemer Plant at the Burbach Works (Das neue Thomasstahlwerk der Burbacher Hütte). F. Schroeder. Illustrated description. 3800 w. Zeitschr d Ver Deutscher Ing—March 20, 1909. No. 4295 D.

The New Basic Bessemer Plant at the Burbach Iron Works (La nouvelle Aciérie Thomas des Usines métallurgiques de Burbach, Prusse rhénane). Illustrated description translated from *Stahl und Eisen* for Nov. 11, 1908. 3500 w. Génie Civil—Jan. 2, 1909. No. 2637 D.

See also Converters, under MECHANICAL ENGINEERING, MACHINE WORKS AND FOUNDRIES.

Blast-Furnace Chargers.

Blast-Furnace Chargers. Illustrates and describes various types of chargers in use in Europe. 2800 w. Ir & Coal Trds Rev—March 12, 1909. No. 3429 A.

Blast-Furnace Design.

A Revolutionary Proposal in Blast Furnace Construction. Describes a proposed construction of iron blast furnace using blast with an excess of oxygen. Ills. 1500 w. Ir Age—Feb. 11, 1909. No. 2387.

Blast-Furnace Fuels.

The Development of the Use of Coke as a Blast-Furnace Fuel in Germany (Die Entwicklung der Roheisenherstellung mit Koks in Deutschland). Fritz W. Lürmann. A historical review. 6000 w. Stahl u Eisen—Jan. 20, 1909. No. 2662 D.

Blast-Furnace Gas.

The Problem of Waste Heat Utilization in Iron Works. John B. C. Kershaw. Shows an outlet for electric power in all large iron smelting works. 1500 w. Ir & Coal Trds Rev—April 2, 1909. No. 3917 A.

The Development of Blast-Furnace Gas-Purifying. C. Flossel. Brief review of devices tried, with illustrated description of a new design of an axial purifying plant. 1000 w. Ir & Coal Trds Rev—March 19, 1909. No. 3629 A.

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Blast-Furnace Gas

The Purification and Economic Utilization of Blast-Furnace Gas (Epuration et Utilisation Economique des Gaz de Hauts-Fourneaux). Louis Detrez. Discusses the problem, methods and cost of cleaning the gas and the economy of its use in gas engines. 5000 w. *Bul Sci d l Assn d Elèves*—June-Oct., 1908. No. 500 D.

See also Gas Power Plants, under MECHANICAL ENGINEERING, COMBUSTION MOTORS; and Blowing Engines, under IRON AND STEEL.

Blast-Furnace Lining.

The Selection of Refractories. Considers the kind and quality of brick best suited for various parts of different furnaces. Ills. 8500 w. *Ir Trd Rev*—Jan. 7, 1909. No. 1609.

Firebrick for Blast Furnaces. Discusses defects which shorten the life of linings, and the remedies. 2000 w. *Ir Age*—April 29, 1909. No. 4327.

Blast-Furnace Operation.

Peroxidation of Iron in Blast Furnaces. Antenor Rizo-Patron. Describes the effect of certain pyritic ores when smelted in blast furnaces. 2500 w. *Eng & Min Jour*—Aug. 21, 1909. No. 7187.

The Limit of Fuel-Economy in the Iron Blast-Furnace. N. M. Langdon. A study of the operation, under various conditions, of a number of furnaces. 7000 w. *Bul Am Inst of Min Engrs*—Oct., 1909. No. 8745 F.

Fuel Economy in the Blast Furnace (La Valeur du Combustible dans les Fours à Cuve et en Particulier dans le Haut-Fourneau). Joseph von Ehrenwerth. A discussion of the utilization of the heat energy of the fuel charged in blast-furnace practice. 6500 w. *Rev de Métal*—Aug., 1909. No. 7918 E + F.

Heating Value of the Fuel in Shaft Furnaces and Especially in the Iron Blast Furnace (Der Wärmewert des Brennstoffes im Schachtöfen und insbesondere im Eisenhochofen). Josef v. Ehrenwerth. A theoretical discussion of the fuel economy of the blast furnace. Serial. 1st part. 2200 w. *Oest Zeitschr f Berg u Hüttenwesen*—Sept. 18, 1909. No. 8660 D.

Blast-Furnace Plants.

The Lübeck Iron Works (Das Hochöfenwerk Lübeck). Illustrated detailed description. 3000 w. *Stahl u Eisen*—April 28, 1909. No. 4859 D.

Blast-Furnace Practice.

Stock Distribution for Blast Furnaces. J. E. Johnson, Jr. Describes a new

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method of rotating and dumping the ball. Ills. 2000 w. *Ir Age*—May 13, 1909. No. 4636.

Blast-Pressure at the Tuyeres and Inside the Furnace. R. H. Sweetser. A report of tests. 1800 w. *Bul Am Inst of Min Engrs*—March, 1909. No. 3471 F.

The Principles of Dynamic Chemistry. in Their Relation to the Blast Furnace. W. J. Foster. Abstract of a paper before the Int. Cong. of Ap. Chem. A study of the chemical changes. 1000 w. *Ir & Coal Trds Rev*—June 11, 1909. No. 5666 A.

On Charcoal Blast-Furnace Practice in the Ural. M. A. Pavloff. Gives some numerical data relating to the seven blast furnaces in the Ural region. 3500 w. *Engr, Lond*—May 14, 1903. No. 4967 A.

Old and Modern Practice in Blowing-in Blast Furnaces (Die Inbetriebsetzung von Hochöfen sonst und jetzt). Fritz W. Lürmann. A comparison of methods and results. 2500 w. *Stahl u Eisen*—Feb. 10, 1909. No. 3359 D.

See also Electro-Metallurgy, under IRON AND STEEL.

Blast Furnaces.

Development in the Size and Shape of Blast-Furnaces in the Lehigh Valley, as Shown by the Furnaces at the Glendon Iron Works. Frank Firmstone. 4000 w. *Bul Am Inst of Min Engrs*—Sept., 1909. No. 8195 F.

Designing Blast Furnaces. M. Pavloff. Gives data from experience and personal knowledge and shows the application of these data to the designing of blast furnaces working under different conditions. 7500 w. *Ir & Coal Trds Rev*—July 9, 1909. No. 6431 A.

The Rate of Combustion in Blast Furnaces. M. A. Pavloff. Gives a table showing general conditions of working and rate of combustion of 40 modern furnaces, with remarks. 1800 w. *Ir Age*—Aug. 26, 1909. No. 7340.

Some American Blast Furnace Plants. The present article gives plan and description of the Haselton furnaces of the Republic Iron & Steel Co., and the plant of the Inland Steel Co., on the west shore of Lake Michigan. 2000 w. *Engr, Lond*—Jan. 8, 1909. Serial, 1st part. No. 1826 A.

The Lubeck Blast Furnaces (Les hauts Fourneaux de Lubeck). Illustrated description of the two furnaces at this German iron works. 2000 w. *Génie Civil*—Sept. 25, 1909. No. 8633 D.

See also Electro-Metallurgy, under IRON AND STEEL.

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Blast-Furnace Slag

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Blast-Furnace Slag.

Economies in the Manufacture of Iron and Steel. G. B. Waterhouse. The second of two articles dealing with the two great economies. The present number considers the utilization of blast-furnace slag, especially in the manufacture of cement. Ills. 4000 w. Engineering Magazine—June, 1909. No. 4985 B.

The Influence of Chemical Composition on the Hydraulicity of Slags (Schmelzversuche zum Nachweis des Einflusses der chemischen Zusammensetzung auf Hydraulizität der Schlacken). H. Passow. Gives results of an elaborate series of tests. 3800 w. Stahl u Eisen—Aug. 18, 1909. No. 7953 D.

Blowing Engines.

Blast Furnace Gas Blowing Engine. Drawings and illustrated description of a 1100-B.H.P. engine for the Barrow Hematite Iron & Steel Co., Ltd. 1800 w. Engr, Lond—Feb. 5, 1909. No. 2491 A.

The Two-Cycle Gas-Blowing Engine Plant at the Works of the Frodingham Iron and Steel Company, Limited. Plate, illustrations and description. 1500 w. Ir & Coal Trds Rev—May 7, 1909. No. 4734 A.

Electrically Operated Blowing Engines for the Converters at the Peine Rolling Mill (Das elektrisch angetriebene Konvertergebläse des Peiner Walzwerks). F. Hartig. Describes the installation and gives results of operation. Ills. 4500 w. Stahl u Eisen—July 14, 1909. No. 7259 D.

Recent Steel Works Blowing Engines (Neuere Stahlwerk-Gebläsemaschinen). C. Michenfelder. Describes recent machines built by the German firm of Ludwig Stuckenholz. Ills. 1500 w. Zeitschr d Ver Deutscher Ing—Aug. 28, 1909. No. 8155 D.

See also Air Compressors, and Turbo-Compressors, under MECHANICAL ENGINEERING, POWER AND TRANSMISSION.

Bosnia.

Iron Making in Bosnia (Eisenhüttenwesen in Bosnien). A general brief review of the industry. Ills. 2300 w. Stahl u Eisen—Oct. 28, 1908. No. 549 D.

British Columbia.

See Washington, under IRON AND STEEL.

California.

An Iron Deposit in the California Desert Region. Charles Colcock Jones. Illustrates and describes a deposit of soft, or semi-hard hematite ore. 2500 w. Eng & Min Jour—April 17, 1909. No. 4003.

Canada.

Iron Ores and Smelting in Canada (Eisenerze und ihre Verhüttung in Kanada). E. Kraynik. A general review of the industry. Ills. 7000 w. Stahl u Eisen—Feb. 24, 1909. No. 3363 D.

China.

Steel Making in China. Theodore D. Morgan. Information concerning the works at Hankow, their labor conditions and iron ore and fuel supplies. 3000 w. Ir Age—Feb. 4, 1909. No. 2247.

The Iron Industry in the Yangtse-Kiang Valley. Information concerning the mineral wealth and of the works of the Hanyang Iron & Steel Co. 1200 w. Ir & Coal Trds Rev—Nov. 20, 1908. No. 747 A.

Copper-Clad Steel.

Copper-Clad Steel. Wirt Tassin. Describes a process by which steel is covered with a copper coat of any desired thickness, describing the product and its uses. 1600 w. Eng & Min Jour—Oct. 23, 1909. No. 8724.

Cost.

Cost of Iron Production in Britain and America. A criticism of recent statements made by Mr. Andrew Carnegie. 2500 w. Engr, Lond—May 7, 1909. No. 4729 A.

Cuba.

The Residual Brown Iron-Ores of Cuba. C. M. Weld. Maps showing locations of deposits and discussion of their character and probable origin. 4000 w. Bul Am Inst of Min Engrs—Aug., 1909. No. 7128 F.

Desulphurization.

The Formation of Silicon Sulphide in the Desulphurization of Iron. W. Fielding. Read before the Faraday Soc. Describes an investigation made of the reaction between ferrosilicon and ferrous sulphide. 900 w. Elec-Chem & Met Ind—Aug., 1909. No. 6824 C.

Dry-Air Blast.

Gayley's Invention of the Dry Blast. Rossiter W. Raymond. Read at Chattanooga meeting of the Am. Inst. of Min. Engrs. Discusses the value of this invention and its commercial economy. 4000 w. Eng & Min Jour—Dec. 19, 1908. No. 1049.

Gayley's Invention of the Dry Blast. R. W. Raymond. Discusses the value of this invention, the commercial economy, etc. 3500 w. Bul Am Inst of Min Engrs—Jan., 1909. No. 2425 F.

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Dry-Air Blast

The Gayley Dry Air Blast. Report of the Franklin Institute through its Committee on Science and the Arts. 2000 w. Jour Fr Inst—July, 1909. No. 6356 D.

Economics in the Manufacture of Iron and Steel. G. B. Waterhouse. Describes important lines along which economies are being effected in this industry. The present article deals with the Gayley dry blast process. Ills. 4000 w. Engineering Magazine—May, 1909. No. 4340 B.

Refrigeration Applied to Air Supply for Blast Furnaces. Bruce Walter. Read before the Am. Soc. of Refrig. Engrs. Describes the refrigerating apparatus for the Isabella Plant of the U. S. Steel Corporation, and states the advantages. 2500 w. Cold Storage & Ice—Dec., 1908. No. 992 C.

Experience with the Gayley Dry Blast at the Warwick Furnaces, Pottstown, Pa. Edward B. Cook. A brief illustrated description of the Warwick plant, with account of its very satisfactory working. 5000 w. Bul Am Inst of Min Engrs—Nov., 1908. No. 683 C.

I. Moisture in Blast. Greville Jones. A report of experiments carried out at Clarence Iron Works, 1909. II. The Fuel Economy of Dry Blast. R. S. Moore. As indicated by calculations from empirical data. Two papers read before the Iron & Steel Inst. 2000 w. Engng—Oct. 1, 1909. No. 8494 A.

A Study of the Gayley Dry-Air Blast (Nachstudie zur Gayleyschen Windtrocknung). M. Drees. A discussion of the practical advantage of the dry blast. Serial. 1st part. 3500 w. Stahl u Eisen—Sept. 15, 1909. No. 8654 D.

The Use of the Dry-Air Blast for Blast Furnaces (Ueber Anwendung getrockneter Gebläseluft im Hochofenbetrieb). J. Bartel. Reviews experience at the Creusot works, France. Ills. Serial, 1st part. 2200 w. Oest Zeitschr f Berg u Hüttenwesen—Jan. 2, 1909. No. 2669 D.

Electro-Metallurgy.

The American Electrochemical Society. Report of the meeting at Niagara Falls, papers read. Many dealt with the electro-metallurgy of iron and steel. 9000 w. Ir Age—May 13, 1909. No. 4637.

Niagara Falls Meeting of the American Electro-chemical Society. Extension and illustrated summary of the meeting with abstracts of papers on Electrometallurgy of iron and steel, and other electro-chemical subjects. Ills. 35,500 w. Elec-Chem & Met Ind—June, 1909. No. 5346 C.

IRON AND STEEL

Electro-Metallurgy

A Study of Electric Furnaces. Charles Albert Keller. From a paper at meeting of the Am. Elec-Chem. Soc. An illustrated account of their application to the manufacture of iron and steel. 6500 w. Ir Age—June 3, 1909. No. 5221.

The Electric Furnace Reduction of Iron Ore. Joseph W. Richards. Read before the Am. Elec-Chem. Soc. Considers the reactions in blast furnaces and the differences in electric furnace smelting of iron ores. 2500 w. Ir Trd Rev—May 15, 1909. No. 4642.

Methods of Refining Steel in the Electric Furnace. John B. C. Kershaw. Deals with arc and induction electric processes for making high-grade steels. Ills. 2500 w. Cassier's Mag—July, 1909. No. 6345 B.

The Treatment of Steel in Electric Furnaces. Henry M. Howe. Considers the bearing of the phenomena noted in these furnaces, and general ideas about the purification of iron. Ills. 8000 w. Eng & Min Jour—Aug. 28, 1909. No. 7389.

Electric Smelting. F. W. Harbord. Abstract of a paper read at meeting of the W. of Scotland Ir & Steel Inst. Deals particularly with the results obtained. 4500 w. Elec Engr, Lond—May 7, 1909. No. 4715 A.

Electric Smelting in Production of Iron and Steel. E. J. Ljungberg. Read before the Ir. & St. Inst. Brief account of present practice, the furnaces used, etc., describing a furnace similar to a common blast-furnace, but with three electrodes supplied with three-phase alternating current. 1000 w. Elec Engr, Lond—Oct. 1, 1909. No. 8478 A.

Electric Furnaces as Applied to the Manufacture of Iron and Steel. Ch. A. Keller. Abstract of paper before the Faraday Soc. Illustrated descriptions of the construction and performances of various types. 3500 w. Elect'n, Lond—July 2, 1909. No. 6294 A.

A Contribution to the Study of Electric Furnaces as Applied to the Manufacture of Iron and Steel. Ch. A. Keller. Abstract of a paper before the Faraday Soc. A report of researches and personal work. Ills. 5800 w. Ir & Coal Trds Rev—June 18, 1909. No. 6053 A.

Smelting of Iron Ore in the Electric Furnace, in Comparison with Blast Furnace Practice. Joh. Hårdén. Compares the various classes of furnaces proposed for the purpose, with the blast furnace. 4000 w. Elec-Chem & Met Ind—Jan., 1909. No. 1678 C.

MINING AND METALLURGY

Electro-Metallurgy

Experiments on Melting in the Induction Furnace. F. A. J. FitzGerald. An account of an experiment at the plant of the Am. Elec. Furnace Co., on the melting capacity of the induction furnace. 800 w. Elec-Chem & Met Ind—Jan., 1909. No. 1674 C.

Melting Metals in the Induction Furnace. An illustrated article presenting the advantages of the induction furnace and giving results of experiments by the American Electric Furnace Co. 2500 w. Ir Trd Rev—March 25, 1909. No. 3507.

The Efficiency of Induction Furnaces. Joh. Hårdén. Gives particulars of results obtained in a 60-kw experimental induction furnace, with a few explanations and comparisons. 2500 w. Elec-Chem & Met Ind—July, 1909. No. 6195 C.

Notes on Iron and Steel. Bradley Stoughton. Discusses briefly the electro-thermic manufacture of iron and steel, and the properties and uses of alloy steels. Ills. 3000 w. Jour Fr Inst—Feb., 1909. No. 2740 D.

Reduction of Iron Ore in the Electric Furnace. Abstract of a paper by Remo Catani, who has recently investigated the possibilities of the electric furnace in iron ore reduction in comparison with the blast furnace. 1700 w. Elec-Chem & Met Ind—April, 1909. No. 3659 C.

The Production of Pig Iron at the Electric Furnace and the Industrial Utilization of Pyrite Residue. F. E. Carcano. Gives an interesting case in which the electric furnace can well hold its own against the blast furnace, with a general comparison. 2000 w. Elec-Chem & Met Ind—April, 1909. No. 3660 C.

Progress in the Electro-Metallurgy of Iron and Steel (Die weiteren Fortschritte der elektrischen Eisen- und Stahlgewinnung). Dr. Albert Neuburger. A review of progress in electric-furnace design and applications. Ills. Serial, 1st part. 4700 w. Glasers Ann—Nov. 15, 1908. No. 1168 D.

Blast Furnaces and Electric Furnaces (Hochofen und elektrischer Ofen). A comparison of the two for the production of pig iron. 2800 w. Stahl u Eisen—Feb. 24, 1909. No. 3364 D.

The Electro - Metallurgy of Iron (L'Electrosiderurgie). Charles Le Chatelier. Comments on, and abstracts of, recent publications on the purification of steel in the electric furnace and on the general progress of the electro-metallurgy of iron. Ills. 6500 w. Rev de Métal—Nov., 1908. No. 1109 E + F.

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An Electric Furnace with One Electrode and with a Conducting Hearth (Sur un Four électrique à une seule Electrode et à Sole Conductrice). M. Durnuis. Researches on such a furnace. Ills. 1500 w. Rev de Métal—Oct., 1908. No. 515 E + F.

Ingot Iron from the Electric Furnace. Trans. of article by B. Osann, in *Stahl und Eisen*. Gives results obtained with the Stassano furnace. Ills. 3500 w. Ir & Coal Trds Rev—Nov. 6, 1908. No. 330 A.

Electric-Furnace Electrodes (L'Ame du Four électrique, l'Evolution de l'Electrode). Isidore Bay. A sketch of the development of the electric furnace, and particularly of the electrodes. Serial, 1st part. 2000 w. L'Elec—June 5, 1909. No. 6534 D.

The Production of Pig Iron in the Electric Furnace and in the Blast Furnace (Produzione della Ghisa al Forno elettrico ed all alto Forno). Remo Catani. A comparison of the two methods. Serial, 1st part. 2800 w. Industria—Feb. 7, 1909. No. 3352 D.

Actual State of the Electro-Metallurgy of Iron (Etat actuel de l'Electro-Metallurgie du Fer). M. Henry. A review of achievements and present practice. Ills. Serial. 1st part. 2500 w. Elec—Aug. 14, 1909. No. 7928 D.

The Development of Electric Steel Plants (Zur Entwicklung der Elektrostahlanlagen). A table giving details of the various electric steel plants in the world. 2000 w. Stahl u Eisen—Oct. 7, 1908. No. 545 D.

Deoxidation and Desulphurization in Electric Steel Furnaces. Dr. R. Amberg. Compares the different electric steel furnaces with respect to the degree and distribution of temperature. 1000 w. Elec-Chem & Met Ind—March, 1909. No. 2986 C.

Steel Making in the Electric Furnace (Etat actuel de la Fabrication de l'Acier au Four électrique). Ch. Clausel de Coussergues. Read before the Congress of Applied Chemistry. An exhaustive discussion of the present state of the art, with descriptions of the principal electric steel works. Ills. 4000 w. Rev de Métal—June, 1909. No. 6507 E + F.

Steel Making by the Girod Electrical Process. Brief illustrated description of the Paul Girod electric steel-making furnace. 1000 w. Ir Trd Rev—Nov. 12, 1908. No. 233.

The Production of Electric Steel. Jas. A. Seager. Illustrated description of the Girod electric furnace, and the properties

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Ferro-Alloys

of steel produced electrically. 1500 w. Ir Trd Rev—June 3, 1909. No. 5228.

The Largest Electric Steel Works. Joseph W. Richards. An account of the Girod works now building at Ugine, in Savoy, France. 1500 w. Elec-Chem & Met Ind—Jan., 1909. No. 1673 C.

The Girod Electrical Process for the Manufacture of Steel Castings. Illustrated description of an installation in Switzerland, with report of operative methods, cost, etc. 2500 w. Ir & Coal Trds Rev—Dec. 24, 1908. No. 1547 A.

The Girod Process (Electrometallurgy du Fer et de l'Acier, Procédés Girod). Describes the engine plant, the materials treated, and the products, particularly the ferro-alloys. Ills. 5000 w. Rev d'Electrochim et d'Electrométal—Jan., 1909. No. 4210 F.

The Gröndal-Kjellin and Röchling-Rodenhauser Electric Steel Furnaces. An illustrated account of experimental work. 3000 w. Engng—Jan. 22, 1909. No. 2220 A.

The Electric Furnace and Electrical Process of Steelmaking. W. Rodenhauser. Read before the I. and S. Inst. An illustrated summary of types of furnaces in present use, with particular reference to the Röchling-Rodenhauser furnace. 7500 w. Ir & Coal Trds Rev—May 14, 1909. No. 5134 A.

The Kjellin and Röchling-Rodenhauser Electric Furnaces. Dr. F. A. Kjellin. Describes the construction and advantages of the Kjellin furnace, giving cost of production of steel; and explains the working of the Röchling-Rodenhauser furnace, and cost of production. Ills. 2000 w. Elect'n, Lond—Oct. 8, 1909. No. 8867 A.

The Heroult Electric Steel Furnace. Robert Turnbull. Reviews the history, illustrating and describing features. 1500 w. Ir Age—May 13, 1909. No. 4638.

Small Experimental Heroult Furnace. C. A. Hansen. Illustrated description of the furnace and the results obtained. 1500 w Elec-Chem & Met Ind—May, 1909. No. 4508 C.

The Keller Process for Producing Steel in the Electric Furnace (La Fabrication électrique des Aciers par le Procédé Ch. A. Keller). Describes the furnace and the various installations. Ills. 2000 w. Rev d'Electrochim et d'Electrométal—Dec., 1908. No. 2612 F.

Automatically Circulating Furnaces of the Gin Type for the Electrical Production of Steel. Gustave Gin. Abstract of a paper read before the Faraday Soc. Illustrated description. 1500 w. Ir & Coal Trds Rev—June 18, 1909. No. 6056 A.

Report of the Investigation of an Electric Shaft Furnace, Domnarfvet, Sweden. Eugene Haanel. Also chapters descriptive of the manufacture of electrodes, and of the latest types of charcoal furnaces, with appendices on the progress of electric smelting in Norway and Sweden. Ills. 7500 w. Canada Dept of Mines. No. 32. No. 7786 N.

Pig Iron Production in an Electric Shaft Furnace. Illustrated account of investigations at Domnarfvet, Sweden, by Dr. Eugene Haanel. 5000 w. Ir Age—Sept. 16, 1909. No. 7766.

Electric Production of Pig Iron. Illustrated description of the electric blast-furnace in use at Domnarfvet, Sweden. 700 w. Engng—Sept. 24, 1909. No. 8363 A.

See also same title, under ELECTRICAL ENGINEERING, ELECTRO-CHEMISTRY; Lash Process, under IRON AND STEEL; and Castings, under MECHANICAL ENGINEERING, MACHINEWORKS AND FOUNDRIES.

Exhibitions.

Iron and Steel at the Franco-British Exhibition. H. Bauerman. Detailed description of exhibits, arranged under their respective districts. 14000 w. Jour Ir & St Inst—No. III, 1908. No. 3481 N.

Ferro-Alloys.

Ferro-alloys (Les Alliages ferrométalliques). M. Chaplet. Read before the Congress of Applied Chemistry. A summary of their properties and methods of preparation. 4000 w. Rev de Métal—June, 1909. No. 6513 E + F.

Investigation of Ferro-boron. K. Iwai and J. C. Bailagh. (Prize thesis.) Describes in detail the experiments made stating conclusions. Ills. 5000 w. Min & Sci Pr—Aug. 7, 1909. No. 7043.

The Dangers of Ferro-Silicon. Gives the report of D. R. Wilson, on "The Properties of Ferro-Silicon," showing the danger connected with its transport. 1500 w. Engng—Dec. 25, 1908. No. 1537 A.

The Poisonous Gases Liberated from Ferro-Silicon in Damp Air (Sur les Gaz toxiques dégagés par les Ferrosiliciums sous l'Action de l'Air humide). Paul Labeau. Results of investigations of their composition and liberation. 3500 w. Rev de Métal—Aug., 1909. No. 7919 E + F.

Ferro-Manganese in the Blast Furnace (Ferromangan im Hochofen). O. Höhl. A review of Josef Jakobi's recent experiments on the production of ferro-manganese from manganese ore in the blast furnace. Ills. 1400 w. Stahl u Eisen—July 21, 1909. No. 7263 D.

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Georgia

Ferro-Manganese in the Blast Furnace. O. Höhl, in *Stahl und Eisen*. Information with reference to successful work in South Russia. 1200 w. *Ir & Coal Trds Rev*—Aug. 27, 1909. No. 7666 A.

Georgia.

Review of Fossil Iron Ore Deposits of Georgia. S. Mays Ball. Concerning the characteristics, extent and location of the Clinton ores, and their development. Ills. 4000 w. *Eng & Min Jour*—July 31, 1909. No. 6788.

Clinton or Red Ores of Georgia. Edwin C. Eckel. A review of a recent report by Dr. S. W. McCaillie, concerning the distribution, character and origin of these ores. Ills. 2000 w. *Ir Trd Rev*—Jan. 7, 1909. No. 1603.

Germany.

The Lorraine Deposits of Oolitic Iron Ore. Tony Callot. Describes these extensive deposits. 4000 w. *Eng & Min Jour*—June 19, 1909. No. 5616.

The Sedimentary Brown Ore Deposits near Hollfeld in Bavaria (Die eluvialen Brauneisenerze der nördlichen Fränkischen Alb bei Hollfeld in Bayern). F. Klockmann. Describes the deposits and the ores. Ills. 4000 w. *Stahl u Eisen*—Dec. 30, 1908. No. 1944 D.

See also Trusts, under INDUSTRIAL ECONOMY.

Harmet Process.

The Harmet Process Applied to Open-Hearth Steel at the "Deutscher Kaiser" Works, Bruckhausen (Das Harmetverfahren im Martinbetriebe der Gewerkschaft "Deutscher Kaiser" in Bruckhausen). Illustrated description of methods, appliances and results. 6500 w. *Stahl u Eisen*—Nov. 4, 1908. No. 1141 D.

Hot-Blast Stoves.

The Design of Hot-Blast Stoves on the Basis of the Heat-Conducting Power of Refractory Materials (Die Berechnung steinerner Winderhitzer unter zugrundelegung des Wärmeleitungsvermögens feuerfester Steine). Bernhard Osann. A complete theoretical treatment. Ills. Serial, 1st part. 2800 w. *Stahl u Eisen*—July 14, 1909. No. 7260. D.

Illinois.

Extinct Iron Industry in Southern Illinois. Henry E. Birkinbine. An account of deposits formerly developed, which may again prove a source of supply. 2500 w. *Ir Tr Rev*—Aug. 5, 1909. No. 6913.

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Ingots

India.

India as an Iron Producer. Information concerning the ancient workings, the materials available, the difficulties experienced, etc. 2500 w. *Engr, Lond*—March 12, 1909. Serial, 1st part. No. 3425 A.

The Development of the Iron and Steel Industry in India. Information concerning this industry. 1000 w. *Ir & Coal Trds Rev*—April 16, 1909. No. 4307 A.

Industrial Development.

Iron and Steel. F. W. Harbord. Read before the Soc. of Chem. Ind. Considers their relation to other industries and the causes that have assisted their vast development. 4500 w. *Sci Am Sup*—Oct. 23, 1909. Serial. 1st part. No. 8587.

Industry.

Some Tendencies in the Iron Industry. John Jermain Porter. A study of the future based on the signs of the times. 4000 w. *Mfrs' Rec*—Oct. 7, 1909. No. 8383.

Ingot Compression.

Fluid Compression of Steel Ingots. J. F. Springer. An illustrated description of the Harmet process and the fluid-compression presses used. 1200 w. *Sci Am*—May 29, 1909. No. 5024.

Rail Rolling Methods. James E. York. Gives reasons why a steel ingot cannot be solidified during the rolling in the blowing mill, and describes the York method of solidifying the ingot. Ills. 1800 w. *Ir Age*—Sept. 16, 1909. No. 7767.

5000-Ton Press for Dynamic Compression of Fluid Steel. Illustrated detailed description of press used in making ingots on the dynamic-compression system. Plate. 2000 w. *Engng*—Jan. 22, 1909. No. 2217 A.

The Harmet Process for the Compression of Steel Ingots (Développement du Procédé de Compression de l'Acier par Tréfilage). F. Beutter. Describes the development of the process and some of the more important installations in which it is used. Ills. 3000 w. *Rev de Métal*—Jan., 1909. No. 2617 E + F.

Ingots.

The Riemer Hot Top Process of Prevention Piping in Steel Ingots. J. F. Springer. An explanation of piping and illustrated descriptions of processes to prevent it, especially the process named. 6000 w. *Ir Trd Rev*—June 24, 1909. No. 5883.

The Harmet Process of Ingot Compression. J. F. Springer. Illustrated description of the apparatus, process, and results. 2500 w. *Ir Age*—June 24, 1909. No. 5859.

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Italy

Notes on Tests of Ingots and Derivative Shapes in Progress at Watertown Arsenal. James E. Howard. Read before the Am. Soc. for Test. Mat. Tests to obtain information on the causes which produce unsoundness. Ills. 1000 w. Ir Trd Rev—July 8, 1909. No. 6206.

Apparatus for the Continuous Production of Steel Ingots. Illustrates and describes the apparatus designed by M. Doupeur. 1000 w. Mech Engr—Sept. 24, 1909. No. 8352 A.

Italy.

The Iron and Steel Industries of Italy. Abstract of a paper by M. P. Nicou. A review of deposits, production, imports, exports, etc. 2500 w. Ir & Coal Trds Rev—Dec. 11, 1908. No. 1225 A.

Japan.

Steel Making in Japan. Theodore D. Morgan. Discusses the present standing and possibilities of the industry. 4000 w. Ir Age—Jan. 28, 1909. No. 2121.

Lake Superior.

Estimation of Lake Superior Iron Ore Reserves. George E. Edwards. Gives opinions of a number of experts as to the almost boundless extent of the deposits, and discusses matters that affect the cost of mining. 2000 w. Min Wld—April 10, 1909. No. 3876.

Mesabi Range Mining. J. Fred Wolff. Describes the three prominent methods of mining, the open-pit, milling, and underground systems. Ills. 4800 w. Wis Engr—June, 1909. No. 5690 D.

Cost of Pig Iron Made from Lake Superior Ores. J. R. Finlay. Considers general costs, and the activities of the U. S. Steel Corporation. Cost of transportation greater than cost of mining. Map. 8000 w. Eng & Min Jour—April 10, 1909. No. 3867.

Lapland.

The Iron Ore Deposits of Swedish Lapland. Information taken largely from a description by P. Nicou, in the *Ann. des Mines*. 1500 w. Ir Age—Oct. 7, 1909. No. 8376.

Iron-Ore Deposits of Swedish Lapland (Die Eisenerzlagertstätten des schwedischen Lapplandes). A statistical review. 4000 w. Stahl u Eisen—Sept. 1, 1909. No. 8651 D.

Lash Process.

The Lash Steel Process. F. A. J. FitzGerald. Abstract of paper and discussion, before the Am. Elec-Chem. Soc. Describes the process, discussing the possibility of its application to the electric

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furnace. Ills. 1500 w. Ir Age—Nov. 5, 1908. No. 85.

Maryland.

The Iron Ores of Maryland. Joseph T. Singewald, Jr. Description of occurrence and composition of iron ores as determined by studies of Maryland Geological Survey. 3500 w. Ec Geol—Sept.-Oct., 1909. No. 8570 D.

Michigan.

The Swanzy Iron Ore District. An illustrated description of the operations of the Cleveland Cliffs Iron Co., and the laying out of the beautiful mining town of Gwynn. 1800 w. Ir Trd Rev—Jan. 7, 1909. No. 1602.

Minnesota.

Much Work Done During a Dull Year. Oliver J. Abell. An illustrated account of extensive stripping operations at Mesabi Range mines and the sinking of concrete shafts. 6500 w. Ir Trd Rev—Jan. 7, 1909. No. 1601.

Open-Pit Iron Mining on the Mesabi Range of Northern Minnesota. J. Fred Wolff. Outlines the engineering steps in developing an open-pit mine. Ills. 3000 w. Mines & Min—Feb., 1909. No. 2227 C.

Newfoundland.

Mining Iron Ore at Wabana, Newfoundland. B. S. Stephenson. Illustrated description of the workings of the Nova Scotia Steel & Coal Co., and the mining operations under the sea. 3500 w. Ir Trd Rev—Oct. 14, 1909. No. 8567.

Sinking of Wabana Submarine Slopes. R. E. and A. R. Chambers. An account of these submarine areas, recent investigations having proven an enormous field of iron ore under Conception Bay. Ills. Plates. 3500 w. Can Min Jour—Feb. 15, 1909. No. 2552.

New York.

Clinton Iron Ores in New York State. Data from a report issued by the Educational Department of the State, concerning a recent investigation of their extent and character. 2500 w. Ir Age—Nov. 12, 1908. No. 218.

Stripping Clinton Iron Ore in New York State. Edwin Higgins. Describes these hematite beds and their development. Ills. 2000 w. Eng & Min Jour—Dec. 12, 1908. No. 964.

The Clinton Ores of New York State. D. H. Newland. A summary of the more important economic features as shown in recent investigation. The occurrence of iron ores, their origin, and mining opera-

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New Zealand

tions. Ills. 5000 w. *Bul Am Inst of Min Engrs*—March, 1909. No. 3470 F.

The Great Adirondack Iron Ore Deposit. Gives a review of the interesting history of the largest known deposit outside of the Great Lake ranges. Maps and Ills. 13000 w. *Ir Age*—Oct. 14, 1909. No. 8544.

New Zealand.

The Parapara Iron-Ore Deposits. Dr. James Mackintosh Bell. Illustrates and describes deposits of great economic value and scientific interest. 4500 w. *N Z Mines Rec*—May 17, 1909. Serial, 1st part. No. 6963 B.

Nova Scotia.

Iron Ore Deposits of Nova Scotia. Notes from report by Dr. J. E. Woodman, issued by the Mines Branch, Department of Mines, Ottawa. Map. 800 w. *Can Min Jour*—Aug. 15, 1909. Serial, 1st part. No. 7161.

Report on the Iron Ore Deposits of Nova Scotia. J. E. Woodman. General considerations, with details of iron districts. Maps and Ills. 88500 w. *Canada Dept of Mines*—No. 20. No. 7819 N.

Ohio.

The Mahoning Valley as an Iron Center. Joseph F. Froggett. Reviews the history of this iron district in Ohio, the present article covering the pioneer period. Ills. 3800 w. *Ir Trd Rev*—Jan. 21, 1909. Serial, 1st part. No. 1899.

Historic Stacks in the Hanging Rock Region. Brief account of stacks at the Olive furnace, Lawrence Co., Ohio. 1000 w. *Ir Trd Rev*—Aug. 19, 1909. No. 7153.

Ontario.

Report on the Examination of Some Ore Deposits in the Districts of Thunder Bay and Rainy River, Province of Ontario. F. Hille. 3500 w. *Ir Trd Rev*—Sept. 16, 1909. No. 7791.

Recent Progress in the Mineral Industry in the Thunder Bay and Rainy River Districts. F. Hille. Gives a brief résumé of their history and a review of the past year. 2500 w. *Can Min Jour*—Feb. 15, 1909. No. 2553.

Report on the Examination of Some Iron Ore Deposits in the Districts of Thunder Bay and Rainy River, Province of Ontario. F. Hille. Enumerates and describes the various ore deposits. Maps & Ills. 21500 w. *Can Dept of Mines*—No. 22. No. 4542 N.

The Iron and Steel Industry of the Province of Ontario, Canada. Jas. Gran-
nis Parmelee. An illustrated article giv-

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Pig Iron

ing an outline of the more important plants. 8000 w. *Ir & Coal Trds Rev*—Aug. 27, 1909. No. 7664 A.

Open Hearth.

Producer Gas Fired Furnaces in the Iron and Steel Industries. Oskar Nagle. Illustrated descriptions of types of furnaces in common use. 1500 w. *Ir Trd Rev*—April 8, 1909. Serial, 1st part. No. 3825.

Automatic Control of Motors Operating Open Hearth Tilting Furnaces. Illustrated description of the arrangements at the works of the Jones & Laughlin Steel Co., Pittsburgh, Pa. 2000 w. *Elec Jour*—June, 1909. No. 5550.

A New Martin Furnace with Double Hearth. Abstract of an article by Carl Brisker in *Stahl und Eisen*. Illustrated description. 800 w. *Eng & Min Jour*—Oct. 9, 1909. No. 8428.

A New Double-Hearth Martin Furnace (Ein neuer Martinofen mit doppeitem Herd). Carl Brisker. Illustrated discussion of the efficiency of the double-hearth type. 2300 w. *Stahl u Eisen*—July 28, 1909. No. 7264 D.

See also Assaying, and Harmet Process, under IRON AND STEEL; Gas Producers, under MECHANICAL ENGINEERING, COMBUSTION MOTORS; and Foundry Furnaces, under MECHANICAL ENGINEERING, MACHINE WORKS AND FOUNDRIES.

Pennsylvania.

The Clinton Iron-Ore Deposits of Stone Valley, Huntingdon Co., Pa. J. J. Rutledge. Describes the ores and associated rocks, discussing their origin. Ills. 10500 w. *Bul Am Inst of Min Engrs*—Nov., 1908. No. 687 C.

Equipment and Ore Handling at Cornwall Mine. Quincy Bent. Illustrated description of a mine in Lebanon Co., Penn., where the ore is mined by steam shovels, crushed in pit, handled in 50-ton cars, etc. 1200 w. *Eng & Min Jour*—Oct. 9, 1909. No. 8426.

Pig Casting.

The Gary Pig Casting Plant. Brief illustrated description of the Heyl & Patterson machines at Gary, Ind. 800 w. *Ir Age*—Jan. 14, 1909. No. 1746.

Pig Iron.

Pig-Irons and Their Use. E. Adamson. Abstract of a paper read before the Staffordshire Ir. & St. Inst. Classifies the various pig-irons, and briefly considers the effect of carbon, silicon, sulphur, phos-

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phorus, and manganese, the tests, and grading. 4500 w. *Ir & Coal Trds Rev*—Feb. 26, 1909. No. 3074 A.

Pipe Making.

Heid Spirally Rolled Steel Pipes (Spiralgewalzte Stahlrohre, System Heid). E. v. Radinger. Describes the product, the process of manufacture, and the applications. Ills. 1800 w. *Stahl u Eisen*—Feb. 10, 1909. No. 3360 D.

Piping.

Piping in Steel Ingots. J. F. Springer. An illustrated discussion of methods for its reduction and elimination. 5000 w. *Cassier's Mag*—Jan., 1909. No. 1729 B.

See also Ingots, under IRON AND STEEL.

Production.

The World's Production and Consumption of Iron Ore. Statistics from a recently issued paper by the British Board of Trade. 4500 w. *Ir & Coal Trds Rev*—April 16, 1909. No. 4308 A.

Iron and Steel Production in Recent Years. Editorial review of statistics from the Board of Trade publication, in regard to the principal countries. 2000 w. *Engng*—May 14, 1909. No. 4964 A.

Rolling Mills.

Power Required for Rolling Mills. J. A. Knesche. Discusses a method for determination of most economical size of power generator for rolling mills. Ills. 3000 w. *Ir Trd Rev*—Sept. 2, 1909. Serial. 1st part. No. 7543.

Gas-Electric vs. Steam Equipment for Steel Mills. J. A. Knesche. A study of whether it would pay to discard good steam equipment and replace it with gas-electric equipment. 8500 w. *Ir Trd Rev*—Jan. 7, 1909. No. 1607.

Gas Power for Rolling Mills. Dr. Franz Erich Junge. A discussion limited to a large modern combined iron and steel works embracing all the departments necessary to transform ore into finished product. Ills. 6000 w. *Ir Trd Rev*—May 13, 1909. No. 4641.

Function of Fly-Wheels in Connection with Electrically Operated Rolling Mills. H. C. Specht. Reviews the characteristics of the load curve of a fly-wheel in connection with an induction motor. 2000 w. *Pro Am Inst of Elec Engrs*—June, 1909. No. 5835 F.

Power Requirements for Rolling High-Carbon Steel of Small Section. Brent Wiley. A report of tests. 500 w. *Pro Am Inst of Elec Engrs*—July, 1909. No. 6486 F.

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Rolling Mills

The Continuous Sheet Mill Patents. The decision in the Donner-Bray infringement case. 4000 w. *Ir Age*—Dec. 17, 1908. No. 1036.

The Automatic Manufacture of Steel Rails. Illustrated description of methods involving the use of heavy automatic machinery. 3000 w. *Am Mach*—Vol. 32, No. 17. No. 4351.

The Determination of the Economy of Reversing Rolling Mills. C. A. Ablett. Abstract of a paper before the *Ir. & St. Inst.* A criticism of some of the tests made to determine the economy. 1200 w. *Elect'n, Lond*—Oct. 1, 1909. No. 8487 A.

Manganese Steel Products. Illustrates and describes progress with the Potter process of rolling as employed at Paterson, N. J. 2500 w. *Ir Age*—Sept. 30, 1909. No. 8199.

Experiments with Rolling Mill Plant. F. Carleton Anderson. Abstract of paper read before the Manchester Assn. of Engrs. A report of experiments made to determine the actual power required for driving a similar mill electrically. 1500 w. *Mech Engr*—Jan. 29, 1909. Serial, 1st part. No. 2353 A.

Analysis of Power Consumption in a Roll Pass. G. A. Merkt. Mathematical analysis, with diagrams. 1200 w. *Ir Trd Rev*—April 22, 1909. No. 4147.

Power Requirements in Rolling Steel. Gives some results of the investigations of a special German commission. 1700 w. *Ir Age*—March 11, 1909. No. 3077.

Report of the Commission of Research on the Power Consumption of Rolling Mills (Bericht über die Arbeiten der Kommission zur Ermittlung des Kraftbedarfs an Walzwerken). H. Ortmann. Report of tests made by a committee of the Verein deutscher Eisenhüttenleute. Ills. 11000 w. *Stahl u Eisen*—Jan. 6 1909. No. 2658 D.

Determining the Amount of Power Required in Rolling Mills. Extracts from an article in *Stahl und Eisen*, by Dr. H. Ortmann, reviewing extensive experiments made by direction of the German Ironmaster's Assn. Ills. 7000 w. *Ir & Coal Trds Rev*—May 14, 1909. No. 5139 A.

The Power Requirements of Rolling Mills (Der Kraftbedarf von Walzwerken). H. Groeck. Results of electric-driving tests. Ills. 4000 w. *Zeitschr d Ver Deutscher Ing*—May 22, 1909. No. 5967 D.

Hydraulic Machines in English Rolling Mills (Einige hydraulische Vorrichtungen englischer Walzwerke). K. Rummel. Illustrates and describes apparatus and

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machines for various purposes. 3000 w. Stahl u Eisen—Oct. 14, 1908. No. 546 D.

Electrically - Driven Reversing Roll Trains (Ueber elektrische Umkehr-Walzenstrassen). B. K. Lambrecht. An exposition of driving methods. Ills. 2000 w. Stahl u Eisen—Nov. 18, 1908. No. 1143 D.

New Portable Roll Ways (Neuere fahrbare Hebetische). Illustrated description of recent conveying devices for rolling mills. 2400 w. Stahl u Eisen—Nov. 18, 1908. No. 1145 D.

The Development and Present Condition of the Electric Power and Lighting Plants of the Peine Rolling Mills (Die Entwicklung und jetzige Berschaffenheit der elektrischen Kraftübertragungs- und Beleuchtungsanlagen der Akt.-Ges. Peiner Walzwerk). F. Hartig. Discusses the transformation and distribution of power in these large works. Ills. Serial. 1st part. 1900 w. Elek Kraft u Bahnen—Dec. 14, 1908. No. 1990 D.

Lead in Rolls (Ueber das Voreilen beim Walzen). J. Puppe. A description of the phenomena and a review of theories, with results of tests. Ills. 5500 w. Stahl u Eisen—Feb. 3, 1909. No. 3357 D.

Rolls for Channel and T Profiles (Die Anordnung der Kahler für [-Eisen und hochstegige T-Profil). L. Schaefer. Discusses the dimensioning of the grooves. Ills. 1700 w. Stahl u Eisen—March 24, 1909. No. 4253 D.

New Methods for the Design of Roll Grooves (Neue Methoden zur Berechnung von Kalibrierungen). W. Tafel. Describes methods of designing rolls for rolling various profiles. Ills. 7700 w. Stahl u Eisen—May 5, 1909. No. 5747 D.

Determination of the Size of Motors for Finishing Rolls (Bestimmung der Grösse von Motoren zum Antrieb von Fein und Stabwalzwerken). Gives curves and other data on which determinations may be made. Ills. 1800 w. Stahl u Eisen—Sept. 15, 1909. No. 8653 D.

Tests of a Steam-Driven Reversing Ingot Roll Train (Betriebsversuch an einer Dampf-Umkehrblockstrasse). Results of elaborate power consumption tests. Ills. 2500 w. Stahl u Eisen—Aug. 25, 1909. No. 7956 D.

The New Rolling Mill Plant of the Westfalian Steel Company in Bochum (Die neuen Walzwerksanlagen der Westfälischen Stahlwerke in Bochum). Illustrated detailed description. 2000 w. Stahl u Eisen—May 26, 1909. No. 5750 D.

Electrically Driven. Reversing Ingot Roll Train of the Rhine Steelworks, Duis-

burg-Meiderich (Die elektrisch betriebene Umkehrblockstrasse der Rheinischen Stahlwerke). Georg Meyer. Illustrated detailed description. 7700 w. Stahl u Eisen—June 9, 1909. No. 6564 D.

Electric Reversible Blooming Mill at the Rhine Steel Works, Duisbourg-Meiderich (Train blooming réversible électrique des Aciéries du Rhin, à Duisbourg-Meiderich). Illustrated description, with power-consumption data. 2500 w. Génie Civil—Aug. 21, 1909. No. 7937 D.

Large Rail and Billet Mills at the Gary Steel Plant. Describes large mills designed for highest efficiency. 2200 w. Eng News—March 4, 1909. No. 2997.

The Works of the Indiana Steel Co. Illustrated description of the continuous billet mill recently put in operation at Gary. 2500 w. Ir Trd Rev—Oct. 2, 1909. No. 8731.

The New 152-Inch Mill of the Otis Steel Co. The latest development in large rolling mills for heavy plate is illustrated and described. 1600 w. Ir Trd Rev—Oct. 21, 1909. No. 8732.

The Bray Continuous Sheet Mill. Illustrated description of a mill at South Sharon, Pa. 1500 w. Ir Age—Dec. 31, 1908. No. 1397.

Three-High Rolling-Mill at Mossend Steel Works. Drawings and brief description. Plate. 400 w. Engng—Nov. 13, 1908. No. 446 A.

New Gas-Driven Rolling-Mill Plant at Mossend Works. Illustrated description of the gas plant for new rolling-mill engines and furnaces, at these large works near Glasgow. 4000 w. Engng—Nov. 27, 1908. No. 865 A.

Recent Developments at the Works of the Pather Iron and Steel Company, Limited. Illustrates and describes the new electrically-driven rolling mill recently erected at Wishaw, N. B. 2500 w. Ir & Coal Trds Rev—June 25, 1909. No. 6288 A.

New Electric Rolling Mill Plant at the Works of Messrs. Dorman, Long & Company, Limited. Illustrated detailed description. 3000 w. Ir & Coal Trds Rev—Oct. 30, 1908. No. 201 A.

See also Sheets, Ingot Compression, Pipe Making, and Steel Works, under IRON AND STEEL; Electric Hoisting, under MINING; Electric Driving, under MECHANICAL ENGINEERING, POWER AND TRANSMISSION; and Rails, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS.

Russia.

Russian Iron Trade Conditions. Gives the history of the proposed pool of the

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South Russian Iron Works. 2500 w. Ir Age—Jan. 21, 1909. No. 1861.

The Iron Works of South Russia (Die Eisenhütten Südrusslands). Z. Bielski. Brief general description of their equipment, etc. Serial, 1st part. 3200 w. Oest Zeitschr f Berg u Hüttenwesen—July 31, 1909. No. 7269 D.

Sand Boils

Sand Boils. J. J. Fred Brand. An account of experiments made to determine their causes and prevention. 1200 w. Eng & Min Jour—Feb. 27, 1909. No. 2863.

Segregation.

The Influence of Ingot-Size on the Degree of Segregation in Steel Ingots. Henry M. Howe. A brief illustrated study of segregation. 400 w. Bul Am Inst of Min Engrs—Oct., 1909. No. 8743 F.

Sheets.

Power Consumption in Rolling Thin Sheets (Sur le Travail dépensé dans le Laminage de la Tôle mince). M. de Loisy. Gives results of tests recently made in a large sheet mill. Ills. 2500 w. Rev de Métal—Jan., 1909. No. 2616 E + F.

Toncan Metal. F. M. English. Address to Nat. Assn. of Master Sheet Metal Workers. An outline of the characteristics of this metal. 2500 w. Ir Trd Rev—Aug. 19, 1909. No. 7152.

See also Rolling Mills, under IRON AND STEEL; and Cleaning, under MECHANICAL ENGINEERING, MACHINE WORKS AND FOUNDRIES.

Steel Making.

Steel by the Direct Process. Oscar Stromborg. Describes a method of charging carbon below the surface of the molten bath. 2500 w. Ir Age—Dec. 24, 1908. No. 1251.

The Manufacture of Steel for Castings. Dr. Bradley Stoughton. Read before the Pittsburgh Found. Assn. A discussion of the different processes of making steel for castings, comparing them as to quality, cost, etc. Ills. 5000 w. Ir Trd Rev—Dec. 17, 1908. No. 1038.

The Manufacture of Steel for Castings. Bradley Stoughton. From a paper read before the Phila. Found. Assn. Compares the various processes as to equipment, quality and cost. 3000 w. Ir Age—Feb. 11, 1909. No. 2385.

Manufacture of Steel for Castings. Bradley Stoughton. The open-hearth acid and basic furnaces are compared with the side-blow converter and crucible processes. 3000 w. Foundry—March, 1909. No. 2946.

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Steel Works

Old Material in Steel Production. Editorial discussion of the position of iron and steel scrap. 2500 w. Ir Age—June 10, 1909. No. 5508.

Modern Methods of Bridge Construction. Explains methods and plant used by first-class British works. 5500 w. Engr, Lond—Feb. 19, 1909. No. 2897 A.

See also Lash Process, under IRON AND STEEL.

Steel Works.

The Works of the Indiana Steel Co. at Gary, Ind. This first of a series of illustrated articles describes the blast furnace equipment of a great plant under construction on the shore of Lake Michigan. 10000 w. Ir Trd Rev—Jan. 7, 1909. Serial. 1st part. No. 1606.

The Greatest Steel Plant in the World. First of a series of illustrated articles describing in detail the Gary Works of the Indiana Steel Co. 7000 w. Ir Age—Jan. 7, 1909. Serial. 1st part. No. 1491.

The Great Steel Works of the Indiana Steel Co. at Gary, Ind. Illustrated detailed description of this large capacity plant and its equipment. 4500 w. Eng News—Aug. 12, 1909. No. 7050.

New Steel Works in the United States. The present number gives an illustrated description of the Saucon Works of the Bethlehem Steel Co. 3500 w. Engr, Lond—Nov. 20, 1908. Serial, 1st part. No. 742 A.

The Keystone Works of the Jones & Laughlin Steel Company. A new plant at Pittsburg, Pa., is illustrated and described. 1600 w. Eng Rec—Dec. 12, 1908. No. 960.

The Inauguration of Steel-Making on the Pacific Coast. Plan and description of the first plant west of the Rocky Mts., at Seattle, Wash., for making steel bars and shapes. 1200 w. Ir Trd Rev—Aug. 19, 1909. No. 7151.

Some Observations on Structural Shop Management. Samuel E. Duff. Discusses the principles of accurateness as applied to shop management. Also general discussion. 8500 w. Pro Engrs' Soc of W Penn—April, 1909. No. 4555 D.

Electric Power Problems in Steel Plants. R. Tschentcher. Considers the problems in connection with the various classes of steel mills, and some of the complications. 3500 w. Pro Am Inst of Elec Engrs—Sept., 1909. No. 8179 F.

Jonas & Colver's New Steel Works at Sheffield. Illustrated description of a modern plant for rolling the better grades of open-hearth steel. 2500 w. Ir & Coal Trds Rev—Feb. 26, 1909. No. 3075 A.

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Steel Works

Beardmore's Steel Works at Parkhead, Glasgow. Illustrated detailed description of a newly equipped and organized factory for the production of guns, armor, etc. 5500 w. Engng—April 2, 1909. Serial, 1st part. No. 3905 A.

The Friedenshütte Works. Illustrated description of large works in Germany. Translated from *Stahl und Eisen*. 4000 w. Ir & Coal Trds Rev—July 16, 1909. No. 6694 A.

The Plants of the Upper Silesia Railway Equipment Company, Friedenshütte (Die Anlagen der Oberschlesischen Eisenbahn-Bedarfs-A.-G. zu Friedenshütte). Illustrated detailed description of a very extensive plant. 6500 w. Stahl u Eisen—June 23, 1909. No. 6567 D.

A East Indian Iron and Steel Plant. Illustrated description of the works of the Tata Iron and Steel Co., Ltd., at Sakchi, India, now under construction. 3000 w. Ir Age—Sept. 23, 1909. No. 8004.

See also Bessemer Process, and Electro-Metallurgy, under IRON AND STEEL; Electric Driving, under MECHANICAL ENGINEERING, POWER AND TRANSMISSION; Ore Handling, and Cranes, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING.

Sweden.

Making Iron in Sweden. A. F. Backlin. Illustrates and describes early and modern practice. 1500 w. Ir Trd Rev—June 3, 1909. No. 5229.

Technical, Social and Economic Aspects of Ironstone Mining in Sweden, Its Prospects and Probable Development (Schwedens Eisensteinbergbau in technischer, sozialer und wirtschaftlicher Hinsicht, seine Aussichten und vermutliche Entwicklung). Herr Spackeler. Ills. Serial. 1st part. 4200 w. Glückauf—April 3, 1909. No. 4869 D.

Tariff.

See same title, under INDUSTRIAL ECONOMY.

Tennessee.

Iron Operations in the Chattanooga District. Edwin Higgins. An illustrated description of the general conditions and methods. 2500 w. Eng & Min Jour—Jan. 2, 1909. No. 1437.

Texas.

Iron Ores of Llamo County, Texas. William B. Phillips. Information concerning the iron ore deposits. 2000 w. Mfrs' Rec—July 15, 1909. No. 6317.

IRON AND STEEL

Trade

Tin Plates.

The Manufacture of Tin Plates and Terne Plates. William G. Gray. Read before the Phila. Master Tin & Sheet Metal Workers' Assn. Gives the history of this industry and statistics relating to it. 4500 w. Ir Age—May 20, 1909. No. 4769.

The Manufacture of Roofing Tin. Philip Schaefer. Address before the Nat. Assn. of Master Sheet Met. Workers. Reviews methods from raw materials to finish as practiced in the hammered open hearth tin plate works. 2500 w. Met Work—Aug. 28, 1909. No. 7406.

The Development and Present Condition of the Tin Plate Industry (Ueber die Entwicklung und de gegenwartigen stand der Weissblecherzeugung). Otto Vogel. A technical and commercial review. Ills. 6500 w. Stahl u Eisen—July 21, 1909. No. 7261 D.

Trade.

The Iron and Steel Industry in 1908. Reports a year of depression and small demand with gradual recovery. 8500 w. Eng & Min Jour—Jan. 9, 1909. No. 1582.

The Chicago, Philadelphia, Pittsburgh and Cincinnati Iron Trade in 1908. Reviews by T. J. Wright, A. A. Miller, Robert A. Walker, and H. Eugene Hall. 18000 w. Ir Age—Jan. 7, 1909. No. 1498.

The Tin Plate and Sheet Steel Trades in 1908. B. E. V. Luty. A review of the production and related statistics. 3300 w. Ir Age—Jan. 7, 1909. No. 1499.

The Iron and Steel Trades in 1908. General and district reviews for the year. 15500 w. Ir & Coal Trds Rev—Jan. 1, 1909. No. 1722 A.

The World's Export Trade in Iron and Steel and Its Regulation. Harold Jeans. Read before the Staffordshire Iron & Steel Inst. Discusses the internal working in the various countries in the present number. 6500 w. Ir & Coal Trds Rev—Nov. 27, 1908. Serial, 1st part. No. 871 A.

Progress of the Iron and Steel Industry. P. N. Cunningham. Presidential address reviewing the progress of the iron and steel industry in the West of Scotland for the last 30 years. Plate. 7500 w. Jour W of Scotland Ir & Steel Inst—Oct., 1908. No. 894 N.

The Flow of Steel Through Consumption. Editorial on the movement of products of the steel industry. 2000 w. Ir Age—Nov. 26, 1908. No. 497.

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Tube Making

Tube Making.

The Making of a Cold-Drawn Steel Tube. Illustrated description of the Shelby Process. 3000 w. Sci Am Sup—May 8, 1909. No. 4541.

United States.

The Iron-Ore Supply of the United States. C. Willard Hayes. Classifies and describes the commercial iron ores, and gives the writer's conclusions as to duration of the supply. 2200 w. Bul Am Inst of Min Engrs—April, 1909. No. 4086 F.

The American Iron and Steel Industry. I. Good. A British view of the American trade. 4500 w. Cassier's Mag—May, 1909. No. 4404 B.

The Delay in Southern Iron Development. Edwin C. Eckel. A review of the southern iron industry. 1800 w. Mfrs

LEAD AND ZINC.

Lead Smelting

Rec—Jan. 7, 1909. (Special No.) No. 1563 C.

The Iron Industry of the Pacific Northwest. H. Cole Estep. Information in regard to the iron deposits of this region and their development. Ills. 2200 w. Min Engr—March, 1909. No. 4063 C.

U. S. Steel Corporation.

The United States Steel Corporation's 1908 Report. Reviews this report, which shows a great decline in earnings. 6500 w. Ir Age—March 25, 1909. No. 3482.

Washington.

Iron Ore Deposits of the Pacific Northwest. H. Cole Estep. A study of these deposits, particularly in Washington and British Columbia, their location, nature, extent and mining problems. Ills. 4000 w. Ir Trd Rev—Jan 7, 1909. No. 1604.

LEAD AND ZINC

Australia.

See Lead Milling, under ORE DRESSING AND CONCENTRATION.

Austria.

See same title, under COPPER.

France.

The Mining and Milling of Silver, Lead and Zinc Ores at Pierrefitte Mines, France. William Waters Van Ness. Reviews the history of these mines, describing conditions, mining methods, etc., and giving costs. Ills. 7000 w. Bul Am Inst of Min Engrs—Nov., 1908. No. 684 C.

Germany.

Mining in the Harz. Editorial review of metal mining in this district. 2000 w. Engng—Feb. 12, 1909. No. 2596 A.

Silver-Lead Mining in Freiberg, Germany. Wilton G. Brown. Gives the history of mining in this region, beginning in the 12th century. 2500 w. Eng & Min Jour—May 15, 1909. No. 4683.

India.

The Silver-Lead Mines of Bawdwin. Northern Shan States. T. D. La Touche and J. Coggin Brown. Abstracted from the records of the Geol. Surv. of India. Describes the location, mode of occurrence, and metallurgy. 3000 w. Min Jour—July 10, 1909. No. 6608 A.

Lead.

See same title, under MECHANICAL ENGINEERING, MATERIALS OF CONSTRUCTION.

Lead Alloys.

See Alloys, under MISCELLANY.

Lead Assaying.

The Electrolytic Estimation of Lead and of Manganese by the Use of the Filtering Crucible. F. A. Gooch and F. B. Beyer. Demonstrates processes for the electrolytic deposition of lead dioxide and manganese dioxide. 1200 w. Am Jour of Sci—Jan., 1909. No. 1741 D.

Lead Milling.

Concentrating Difficult Lead Ores at Broken Hill. Gerard W. Williams. Describes methods used at Block 10 mill for treating rhodonite-bearing ores. 2500 w. Eng & Min Jour—May 8, 1909. No. 4565.

Lead Refining.

See Electro-Metallurgy, under GOLD AND SILVER; and Refining, under COPPER.

Lead Smelting.

Smelting Practice at Granby Works, Missouri. Evans W. Buskett. Scotch hearth furnaces are used to smelt lead concentrates. Treatment of smelter fumes with recovery of lead in quantity. 1700 w. Min Wld—Dec. 19, 1908. No. 1065.

Lead Smelting and Refining Practice at Trail, B. C. Describes the treatment of these sulphide ores. 1500 w. Can Min Jour—July 15, 1909. Serial, 1st part. No. 6408.

Modern Silver-Lead Smelting at Laurium, Greece. Henry F. Collins. Describes the ore treatment, and the new American

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Massachusetts

blast furnace installed. Ills. 2500 w. Eng & Min Jour—May 1, 1909. No. 4381.

Smelting Refractory Lead Ores at Laurium. L. Guillaume. Abstract trans. from *Ann. des Mines*. Describes details of a new lead furnace for treating low-grade ores. Ills. 2000 w. Eng & Min Jour—Sept. 4, 1909. No. 7564.

See also Smelters, under COPPER.

Massachusetts.

See Ore Deposits, under MISCELLANY.

Mexico.

Development of Zinc Mining Industry in Mexico. The northern district is reviewed by Philip C. Hanna; the central district by Thomas W. Voetter; the northwest district by Lewis A. Martin. 4000 w. Min Wld—July 3, 1909. No. 6141.

The Mapimi District. J. D. Villarello. Describes the ore deposits. The most abundant primary minerals are mispickel, galena, blende and iron pyrite with calcite as the gangue. The precious metals are irregularly distributed. Ills. 1200 w. Min Wld—July 3, 1909. No. 6149.

Reminiscences of Mining in Durango. Walter D. Beverly. Describes early conditions and the improvements in railroad facilities, and in the establishment of law and order; describing the smelting practice. Ills. 3500 w. Eng & Min Jour—Oct. 2, 1909. No. 8264.

See also same title, under GOLD AND SILVER.

Missouri.

History of Southeast Missouri Lead District. Otto Ruhl. Illustrated historical review and description. 2500 w. Min Wld—April 17, 1909. Serial, 1st part. No. 4017.

Typical Mining Practice in Southeast Missouri. Otto Ruhl. Illustrates and describes the system. 2500 w. Min Wld—May 29, 1909. No. 5169.

Migrations of the Joplin Zinc Belt. Charles R. Keyes. Diagrams and outline of geologic history. 1000 w. Eng & Min Jour—May 22, 1909. No. 4922.

See also Ore Deposits, under MISCELLANY.

Nevada.

See same title, under GOLD AND SILVER.

New Mexico.

The Tres Hermanas Mining District, New Mexico. Waldemar Lindgren. Abstract from Bul. U. S. Geol. Surv. Describes veins rich in lead and gold, with deposits of zinc, and the general geologic

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formation. 2000 w. Min Wld—May 8, 1909. No. 4579.

See also same title, under COPPER.

Oklahoma.

Miami Lead and Zinc District in Oklahoma. Otto Ruhl. Describes the ore occurrence, difficulties in milling, and gives the capacity of some of the mills. Ills. 2000 w. Eng & Min Jour—Nov. 7, 1908. No. 150.

Production.

The Production of Lead and Spelter in 1908. A review of mining conditions, production, prices, exports and imports during 1908. Also report of tin. 10000 w. Eng & Min Jour—Jan. 9, 1909. No. 1581.

Tennessee.

The East Tennessee Zinc Mining District. Samuel W. Osgood. Illustrates and describes the mines and deposits, which are too low-grade for small operations. 2500 w. Eng & Min Jour—Feb. 20, 1909. No. 2558.

Wales.

Flintshire District. H. L. Terry. Information concerning the silver-lead mines and spelter works. 1700 w. Min Jour—Feb. 13, 1909. No. 2589 A.

Zinc Recovery.

The Electrolytic Recovery of Zinc. Walther Stoeger. Briefly reviews the new methods of extraction that have been tried for zinc ores, describing a sulphuric acid process that has stood the test of practical application. 1200 w. Min Jour—Jan. 30, 1909. Serial, 1st part. No. 2355-A.

The Electrolytic Recovery of Zinc (Elektrolytische Zinkgewinnung). Walther Stöger. A brief review of recent progress. Ills. 2400 w. Oest Zeitschr f Berg u Hüttenwesen—Jan. 2, 1909. No. 2668 D.

Zinc Smelting.

Zinc Smelting for Pigment. Evans W. Buskett. Information concerning the manufacture of zinc pigment. Ills. 1200 w. Min & Sci Pr—Oct. 31, 1908. No. 112.

A Revolving Retort for Volatilizing Zinc Ores. H. H. Hughes. Explains the aim of the revolving retort and gives illustrations and description. 2000 w. Min Wld—July 10, 1909. No. 6262.

The Central Zinc Company's Works at Seaton Carew. Illustrated detailed description of extensive new works on the

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N. E. Coast of England. Plate. 2500 w. Engng—Jan. 29, 1909. No. 2358 A.

The Method of Extracting Zinc in Australia. John Plummer. Describes recovering zinc from the waste of Broken Hill silver-lead mines. Ills. 1200 w. Min Wld—Nov. 7, 1908. No. 158.

Progress in the Electro-Metallurgy of Zinc and Cadmium (Neuerungen in der Elektrometallurgie des Zinks und des Kadmiums). Franz Peters. Refers to both electro-thermic and electrolytic pro-

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Amatrice

cesses. Ills. 7200 w. Glückauf—Sept. 25, 1909. No. 8666 D.

Zinc Tariff.

Tariff on Zinc Ores. S. Duffield Mitchell. Discusses the need of protection for zinc ores. 6600 w. Pro Am Min Cong—1908. No. 4137 N.

Zinc Trade.

The London Spelter Market in 1908. A review by months. 1500 w. Eng & Min Jour—Jan. 23, 1909. No. 2035.

MINOR MINERALS

Alkaline Earths.

A System of Qualitative Analysis for the Common Elements. William C. Bray. Contribution, No. 39, from the Research Laboratory of Physical Chemistry of the Mass. Inst. of Tech. This fourth article of a series treats of the analysis of the alkaline earth and alkali groups. 15500 w. Tech Qr—Dec., 1908. No. 3440 E.

Aluminium.

Aluminium. E. B. Wilson. Its uses, sources, assay processes, etc. 1800 w. Mines & Min—March, 1909. No. 2956 C.

Aluminium. J. A. McKenzie Williams. Information in regard to production, and methods of reduction, reviewing the past history of development and present uses. Ills. 5500 w. Ap Sci—March, 1909. No. 4091 C.

Notes on Aluminium. Prof. A. Humboldt Sexton. Its properties, compounds, minerals, purification, etc., are discussed in the present number. 3300 w. Mech Engr—Nov. 13, 1908. Serial, 1st part. No. 430 A.

Aluminium as a Factor in the Electrical Industry. The present number briefly considers its use both for electrical purposes and in other ways. 2500 w. Elect'n, Lond—Nov. 27, 1908. Serial, 1st part. No. 862 A.

The Electrolytic Reduction of Aluminium as a Laboratory Experiment. M. deKay Thompson. Describes difficulties encountered in attempting to electrolyze a solution of aluminium oxide in melted cryolite according to the Hall patent, showing how they may be overcome to a certain extent. 1500 w. Elec-Chem & Met Ind—Jan., 1909. No. 1679 C.

Aluminium and Some of Its Uses. J. T. W. Echevarri. Read before the Inst. of Metals. Its manufacture, properties,

methods of working and its applications are considered. 4000 w. Min Jour—Nov. 14, 1908. Serial, 1st part. No. 439 A.

The Development of the Aluminium Corporation, Ltd. Illustrated description of plants for the production of aluminium by the electro-thermal process. 6500 w. Elec Rev, Lond—Nov. 6, 1908. No. 310 A.

Three new British Aluminium Works. Illustrated description of the Dolgarrog works in North Wales, the Wallsend works and the Kinlochleven works in western Scotland. 3500 w. Elec-Chem & Met. Ind—Jan., 1909. No. 1683 C.

The Production of Aluminium and its Industrial Applications (Die Herstellung des Aluminiums und dessen industrielle Verwendung). Herr Goldberg. Its reduction from ore, its properties, alloys, uses, etc. Serial, 1st part. 1500 w. Giesserei-Zeit—Jan. 1, 1909. No. 2684 D.

The Electrical Reduction of Aluminium, a Laboratory Experiment (Die elektrische Reduktion des Aluminiums, ein Laboratoriums-Experiment). F. Bock. Describes the experiments and gives results. Ills. 2000 w. Elektrochem Zeitschr—Aug., 1909. No. 7947 D.

Alunite.

Determination of Alunite. R. B. Gage. Describes laboratory and field methods for its quantitative and qualitative determination. 2400 w. Eng & Min Jour—June 5, 1909. No. 5294.

Prospecting for Ores of the Goldfield Type. J. Volney Lewis. Discusses conditions under which Alunite indicates the presence of gold and its occurrence. 1150 w. Eng & Min Jour—June 5, 1909. No. 5293.

Amatrice.

Amatrice, a New Gem Stone of Utah. Edward R. Zalinski. A matrix stone, con-

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Antimony

sisting of the minerals variscite and chalcodony, with wardite or possibly other hydrous aluminum phosphates and quartz. Ills. 2000 w. Eng & Min Jour—May 22, 1909. No. 4920.

Antimony.

Antimony. E. B. Wilson. Its uses, ores, methods of testing, etc., are discussed. 3000 w. Mines & Min—May, 1909. No. 4482 C.

Notes on Antimony. Prof. A. Humboldt Sexton. Considers its physical and chemical properties, its compounds, minerals, treatment, etc. Ills. 4000 w. Mech Engr—Oct. 30, 1908. No. 182 A.

The Auriferous Antimony Ore of West Gore, Nova Scotia. D. F. Haley. Describes the geological conditions, development, and ore treatment. Ills. 2200 w. Eng & Min Jour—Oct. 9, 1909. No. 8425.

Antimony in Peru. Eugen Weckwarth. Brief description of the occurrence and associated minerals. 1800 w. Min Jour—Aug. 14, 1909. No. 7319 A.

See also Alloys, under MISCELLANY.

Arsenic.

Arsenic (As). E. B. Wilson. Deals with its uses, occurrence, tests, methods of analysis, etc. 3000 w. Mines & Min—June, 1909. No. 5243 C.

Asbestos.

Asbestos: Its Occurrence, Production and Uses. J. S. Diller. Abstracted from advance chapter of Mineral Resources of U. S. Deals principally with the deposits of Canada and the United States. 3500 w. Min Wld—Aug. 28, 1909. No. 7395.

Quebec Asbestos: World's Supply Controlled. Alex. Gray. Information in regard to output, value, profits, etc. 3500 w. Min Jour—April 3, 1909. No. 3904 A.

On the Asbestos Deposits of the Eastern Townships of Quebec. John A. Dresser. Describes the geology, the deposits, and gives other information. Ills. 2500 w. Ec-Geol—March, 1909. No. 3255 D.

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The Chrysotile Asbestos Formation at Marble Bar, Western Australia. C. W. Marsh. Describes the more notable fea-

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Carborundum

tures of the occurrence, and discusses working costs. 3000 w. Min Jour—Sept. 25, 1909. No. 8348 A.

Barium.

Barium (Ba) Ores. E. B. Wilson. Where found, uses, and methods of preparation of barité. 2200 w. Mines & Min—July, 1909. No. 6180 C.

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The Borate Deposits of the Atacama Desert, Argentine Republic. Dr. Fritz Reichert. Briefly describes the most important deposits, giving geological data. 2500 w. Min Jour—June 12, 1909. No. 5632 A.

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American Borax Deposits. Charles R. Keyes. Deals with the deposits and methods of mining, and the supply. 1700 w. Eng & Min Jour—Oct. 23, 1909. No. 8730.

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Boron.

Boron. E. B. Wilson. Information concerning the minerals in which it occurs; tests and methods of analysis; its uses, etc. 3500 w. Mines & Min—Oct., 1909. No. 8262 C.

Building Stone.

Building Stone of Oklahoma. L. L. Hutchison. Reports an unlimited supply of granite, sandstone, limestone and marble of good quality. 3500 w. Mfrs Rec—Jan. 7, 1909. (Special No.) No. 1566 C.

Granite and Marble Resources of the South. Ernest F. Burchard. Information concerning production, the distribution and quality of the deposits. 4000 w. Mfrs Rec—Jan. 7, 1909. (Special No.) No. 1564 C.

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The Works of the Carborundum Company at Niagara Falls. An illustrated sketch of recent developments. 1600 w. Elec-Chem & Met Ind—May, 1909. No. 4504 C.

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MINING AND METALLURGY

Cement

Cement.

Portland Cement. John L. Howard. Read before the Berkeley Club. Reviews the discoveries that mark the development of this material. 4500 w. *Min & Sci Pr*—May 1, 1909. No. 4530.

The Manufacture of Portland Cement. William M. Kinney. A brief historical review, with description of modern methods of manufacture. Ills. Discussion. 6000 w. *Pro Engrs' Soc of W Penn*—March, 1909. No. 3814 D.

I. Manufacture of Portland Cement from Materials High in Magnesia. Richard K. Meade. II. The Effect of Magnesia on Portland Cement. Dr. Rudolph Dyckerhoff. Two important articles on the permissible quantity of magnesia. 3000 w. *Cement Age*—Dec., 1908. No. 1321.

A New Viewpoint of the American Portland Cement Industry. Edwin C. Eckel. Read before the Assn. of Am. Portland Cement Mfrs. Discusses the future growth of the industry, future prices, influence of patents, etc. 4500 w. *Eng Rec*—Jan. 9, 1909. No. 1571.

A Design for a Portland Cement Plant with a Car System for Transporting Materials. C. J. Tomlinson. Plans and description of a departure from accepted designs for this work. 1200 w. *Eng News*—Nov. 19, 1908. No. 375.

Critical Economies in Portland Cement Production. E. A. Richmond. Discusses the best length and diameter for kilns, effects of fine grinding, costs, etc. 2500 w. *Eng Rec*—May 15, 1909. No. 4694.

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MINOR MINERALS

Diamonds

Cement Works at Southam. Illustrated detailed description. 2000 w. *Engr*, Lond—Jan. 1, 1909. Serial. 1st part. No. 1716 A.

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The Tonto Portland Cement Works, at Roosevelt Dam, Arizona. Edgar Percival. Illustrated description of this plant constructed to supply the dam works, with features of the manufacture and statement of cost. 2000 w. *Munic Engrng*—Feb., 1909. No. 2333 C.

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Chromite.

Chrome Ore in Canada. Phillips Thompson. Information concerning these deposits, taken from a recent report by Fritz Cirkel. 800 w. *Eng & Min Jour*—Oct. 9, 1909. No. 8427.

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Clay.

Clay Mining and Its Relation to Coal Mining. Richard R. Hice. Read before the Coal Min. Inst. of Am. Discusses methods and reasons why the industry has generally proved unprofitable. 3000 w. *Eng. & Min Jour*—July 17, 1909. No. 6389.

Our Visible Supply of Brick. M. B. Baker. Describes the clay deposits of Eastern Canada. 2800 w. *Can Min Jour*—Feb. 15, 1909. No. 2549.

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Researches in Diamond Making. F. H. Mason. An account of the experimental work of Richard Threlfall. 1200 w. *Min & Sci Pr*—Dec. 5, 1908. No. 919.

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Kimberlite Rock and the Origin of Diamonds. F. W. Voit. Gives a description of the diamond-bearing rocks, and a study

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Petrographic Note on the Diamond-Bearing Peridotite of Kimberley, South Africa. Victor Hartog. A microscopic study, with a bibliography of the subject by A. A. Julian. Ills. 9000 w. *Ec-Geol*—Aug., 1909. No. 7888 D.

The Diamond Bearing Highlands of Bahia. J. C. Branner. Illustrates and describes this region in Brazil, outlining the geology, describing the diamond producing area, and mining methods used. 4000 w. *Eng & Min Jour*—May 15, 1909. Serial. 1st part. No. 4682.

The Copeton Diamonds, New South Wales. A. R. Pike. Notes on the alluvial deposits and the diamond matrix of this field. 2500 w. *Aust Min Stand*—Jan. 27, 1909. Serial, 1st part. No. 3047 B.

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Fluorspar.

Kentucky Fluorspar and Its Value to the Iron- and Steel-Industries. F. Julius Fohs. Describes the Memphis mine, near Marion, Ky., discussing the origin of the deposits, describing the fluorspar mills, and explaining the value of the product in the metallurgy of iron and steel. 5000 w. *Bul Am Inst of Min Engrs*—April, 1909. No. 4089 F.

Barium and Sulphur in Fluorspar. Henry G. Martin, in *Jour of Ind & Engng Chem*. Describes a rapid means of properly valuing this material. Details of a method using the Sundstrom bomb. 1500 w. *Ir Age*—Aug. 5, 1909. No. 6892.

Fluorspar in Colorado. Ernest F. Burckhard. Describes the deposits and their preparation for market, and explains matters relating to this industry. 3000 w. *Min & Sci Pr*—Aug. 21, 1909. No. 7373.

Graphite.

Graphite in the South. Dr. F. W. Ihne. Information concerning the varieties of graphite, where found, the value of southern deposits, the development, etc. Ills. 10000 w. *Mfrs Rec*—Jan. 7, 1909. (Special No.) No. 1567 C.

The Work of the International Acheson Graphite Company at Niagara Falls. Illustrates and describes the present equip-

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Manganese

ment of these works. 1800 w. *Elec-Chem & Met Ind*—May, 1909. No. 4503 C.

Graphite Mining Near La Colorado, Sonora, Mexico. Frank L. Hess. An illustrated account of the deposits, methods and product. 3500 w. *Engineering Magazine*—Oct., 1909. No. 8173 B.

The Flake Graphite Industry in the United States. Frederick D. Chester. Considers the commercial features of the industry. 900 w. *Eng & Min Jour*—Oct. 16, 1909. No. 8722.

See also same title, under ORE DRESSING AND CONCENTRATION.

Gypsum.

Gypsum Mining. W. J. Jones. Describes the application of room and pillar methods at mines near Akron, N. Y. 1000 w. *Mines & Min*—June, 1909. No. 5238 C.

Gypsum on Cape Breton Island, Nova Scotia. John Tyssowski. Map and description of the deposits, and operations. 1200 w. *Eng & Min Jour*—Sept. 18, 1909. No. 7827.

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Sources and Uses of Manganese in United States. E. C. Harder. Abstracted from Mineral Resources of U. S. Information concerning the ores that yield manganese, the location of the deposits, and some of the uses. 2000 w. *Min Wld*—Oct. 23, 1909. No. 8716.

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A Manganese Deposit in Southern India. R. O. Ahlers. Describes particularly the deposits of the State of Sandur, Bellary District, in the north of Madras Presidency. 4000 w. *Inst of Min & Met*, *Bul.* No. 50—Nov. 12, 1908. No. 893 N.

Manganese, a Metal of the Future (Un Métal d'Avenir: le Manganèse). A review of its properties, ores, sources, appli-

Marble

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Ancient Marbles Used in Modern Times. Mary W. Porter. Reviews the sources of the ancient stone supply. 2500 w. Sci Am Sup—Aug. 21, 1909. No. 7150.

Mercury.

Shortening the Roasting Period for Mercury Ores. William B. Dennis. Describes improvements in roasting low-grade mercury sulphide ore at Blackbutte, Ore. Ills. 4000 w. Eng & Min Jour—July 17, 1909. No. 6392.

Dulces Nombres Quicksilver Deposit, Mexico. Percy Andrus Babb. Describes the interesting geology of these deposits, giving a theory of the ore deposition. Ills. 2800 w. Eng & Min Jour—Oct. 2, 1909. No. 8276.

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Mica.

Mica Mining. A. S. Atkinson. Remarks on the increased value of mica deposits, the mining methods in the United States and Canada, etc. 1600 w. Eng & Min Jour—May 8, 1909. No. 4566.

Molybdenite.

The Molybdenite Deposits of Tunk Pond, Maine. B. W. Hills. Describes the deposits and the geology of the region. 1500 w. Min Wld—Aug. 7, 1909. No. 6935.

Molybdenum.

Occurrence and Uses of Molybdenum Ores. Summary of facts in regard to the occurrence, production and uses, as given in a Bulletin of the Imperial Institute. 2500 w. Aust Min Stand—Dec. 9, 1908. No. 1894 B.

Monazite.

Monazite and Monazite-Mining in the Carolinas. Joseph Hyde Pratt, and Douglas B. Sterrett. Describes the mineral, its occurrence, geology, the deposits, magnetic separation, and uses. Ills. 9500 w. Bul Am Inst of Min Ingrs—June, 1909. No. 5848 F.

Monazite Occurrence and Mining in the Carolinas. Joseph Hyde Pratt and Douglas B. Sterrett. Abstract from Bul. U. S. Geol. Surv. Illustrated description. 5000 w. Min Wld—July 24, 1909. No. 6656.

Natural Gas.

Natural Gas. Lee B. Mettler. From a paper before the convention of Kansas

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Nickel

Assn. of Master Plumbers. Deals with the pressure of natural gas in Kansas and methods of house piping. 1200 w. Met Work—Aug. 28, 1909. No. 7405.

Geology as Applied to the Formations in which Natural Gas is Found in the Appalachian Regions. John Adams Bow-nocker. Considers only the northern part of this field. 6000 w. Am Gas Lgt Jour—June 28, 1909. No. 5929.

The Anticlinal and Hydraulic Theories of Oil and Gas Accumulation. Malcolm J. Munn. Discusses practical application of these theories and the advantages of the latter in prospecting for new pools of oil and gas. Also discussion of above by F. G. Clapp. 6500 w. Ec Geol—Sept.-Oct., 1909. No. 8569 D.

Field Operations in Natural Gas. William McNair Welsh. Read before the Nat. Gas Assn. Discusses the supply, flow through pipes, wells, etc. 3500 w. Am Gas Lgt Jour—July 5, 1909. No. 6101.

Long Distance Pumping of Natural Gas. Snowden B. Redfield. Illustrates and describes the gas-pumping and compression plants, employing gas engines to drive the compressors. 2500 w. Am Mach—Vol. 32. No. 21. No. 5015.

The Natural Gas Situation at Huntsville, Ala. John R. Lynn. Aims to give a true statement of what is known of this field. 3000 w. Am Gas Lgt Jour—Feb. 8, 1909. No. 2312.

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The Bottineau Gas Field. John G. Barry. Describes this region in North Dakota. 800 w. Eng & Min Jour—May 29, 1909. No. 5162.

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Notes on Nickel. Prof. A. Humboldt Sexton. Considers its properties, compounds, minerals, etc., in the present number. 2000 w. Mech Engr—Nov. 27, 1908. Serial. 1st part. No. 854 A.

A New Method for the Determination of Nickel in the Presence of Cobalt (Nuevo Procedimiento para el Dosaje del Niquel en Presencia del Cobalto). Juan A. Sánchez. A technical description of the method. 4000 w. Anales d l Soc Cien Argentina—Oct., 1908. No. 2657 E + F.

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Ocher.

The Mining and Treatment of Ocher in Georgia. S. Mays Ball. Describes the deposits, their mining and preparation for market. Ills. 1500 w. *Min Wld*—March 6, 1909. No. 3021.

Oil.

The Petroleum Resources of the United States. David T. Day. Considers the store of petroleum known within the limits of the country, the rate at which it is being exhausted, the extent of waste, and suggests methods by which its use may better serve both present and future needs. Map. 4000 w. *Am Rev of Revs*—Jan., 1909. No. 1735 C.

The Petroleum Industry of the United States. A review of developments in the various districts during the past year. 10000 w. *Eng & Min Jour*—Jan. 9, 1909. No. 1584.

Petroleum in 1908 Largest Production on Record. David T. Day. Reports the production from the different fields. 3500 w. *Min Wld*—Feb. 6, 1909. No. 2324.

Economic Possibilities of American Oil Shales. Charles Baskerville. Information concerning this industry both abroad and in America. The by-products often pay entire expense. Ills. 4500 w. *Eng & Min Jour*—July 24, 1909. Serial, 1st part. No. 6639.

Broad Survey of Southern Potentialities in Mineral Development. Dr. David

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Oil

T. Day. Information concerning the development of oil-fields, sulphur beds, natural gas, and the chemical industries. 6000 w. *Mfrs Rec*—Jan. 7, 1909. (Special No.) No. 1555 C.

Notes on the Oil and Gas Industry. Describes the geology of the deposits, giving the history and development of the industry. Map. 2400 w. *Min Wld*—Nov. 28, 1908. No. 708.

Studies in the Application of the Anticlinal Theory of Oil and Gas Accumulation. Malcolm J. Munn. This paper considers the structural and stratigraphic position of certain oil pools in western Penn. with the object of showing that the accumulations are not due to movement by difference in gravity of oil and salt water contained in the oil bed. Ills. 5500 w. *Ec-Geol*—March, 1909. No. 3256 D.

The Steel Oil Derrick. R. B. Woodworth. Reviews briefly the history of the petroleum industry, the production, the geological conditions affecting the depth of wells, types of well-drilling mechanism, the loads on the derrick and machinery, stresses, and the complete drilling machine of 1909 design. Ills. Discussion. 17500 w. *Pro Engrs' Soc of W Penn*—June, 1909. No. 6375 D.

Practical Determination of the Commercial Value of Illuminating Oils (*Détermination pratique de la Valeur commerciale des Pétroles destinés à l'Eclairage*). Eugène Marquet. Illustrated description of methods of determining the illuminating power of petroleum oils. 3500 w. *Tech Mod*—March, 1909. No. 4231 D.

The Genesis of Petroleum Deposits (*Die Entstehung der Erdöllagerstätten*). Hans Höfer. A review of theories. 3600 w. *Oest Zeitschr f Berg u Hüttenwesen*—May 22, 1909. No. 5754 D.

New Method of Extracting Oil from Boreholes. Frederick A. Talbott. The principal feature is an endless cable covered with absorbent material and operated from a drum at the surface. 2000 w. *Eng & Min Jour*—May 15, 1909. No. 4686.

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Oil Field at Follansbee, W. Va. Frank W. Brady. Gives the location of the wells, with history of the development, production, etc. 3000 w. *Mines & Min*—Dec., 1908. No. 716 C.

Notes from the Oil Fields. Frank W. Brady. Brief account of development in the Brooke County, W. Va., and Steuben-

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Oil and Gas in the St. Louis District. H. A. Wheeler. Shows the value of geologic aid in prospecting for oil and gas, describing the Illinois fields. Diagrams. 4500 w. *Jour Assn of Engng Socs*—April, 1909. No. 5840 C.

Oil and Gas in Oklahoma. Charles N. Gould. Reviews the discoveries thus far made and their development. 2000 w. *Mfrs Rec*—Jan. 7, 1909. (Special No.) No. 1562 C.

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Problems of the Russian Oil Industry. Frank Richards. Explains conditions at Baku, Russia. 1700 w. *Eng & Min Jour*—July 10, 1909. No. 6249.

A Sketch of the Geology of the Baku and European Oil Fields. Leonard V.

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Platinum

Dalton. Describes only the regions which have contributed appreciably to the world's supply of petroleum—the Caucasus, Rumania, and Galicia. Maps. 7500 w. *Ec-Geol*—March, 1909. No. 3253 D.

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The Gem Bearing Pegmatites of Western Maine. W. Rogers Wade. History and description of the deposits where tourmaline, beryl, feldspar and mica are obtained. 4000 w. *Eng & Min Jour*—June 5, 1909. No. 5296.

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Platinum at the Cracker Jack Mine, Douglas County, Oregon. H. B. Pulsifer. On the treatment of platinum-bearing black sands. 1000 w. *Eng & Min Jour*—Nov. 21, 1908. No. 408.

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Platinum

Geology of the Platinum Deposits of Colombia. J. Ciceron Castillo. Describes the conditions and the gold and platinum deposits of this region. Map. 1700 w. *Min & Sci Pr*—June 12, 1909. No. 5590.

The Russian Platinum Industry and Its Regulation. E. De Hautpick. Gives statistics of output and consumption, discussing the dissatisfaction of producers, and proposed legislation. 3000 w. *Min Jour*—May 8, 1909. No. 4722 A.

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Precious Stones.

Gems and Precious Stones of Mexico. George F. Kunz. Information concerning their occurrence, and what is known of the different gems reported. 4500 w. *Min Wld*—July 3, 1909. No. 6139.

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The Influence of Moist Air on Quicklime. Jas. Gray. Brief account of experiments and conclusions. 700 w. *Jour Chem, Met & Min Soc of S Africa*—May, 1909. No. 6672 E.

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Radium: Its Occurrence in Australia. S. Radcliff. Explains a simple method of determination. 3500 w. *Aust Min Stand*—June 23, 1909. No. 6864 B.

Rare Elements.

A Brief Statement of the Rising Importance of the Rare Elements. Reviews the remarkable progress in the use of tungsten, vanadium, uranium, monazite, molybdenite and other rare minerals. 3000 w. *Pro Am Min Cong*—1908. No. 4136 N.

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The Occurrence of the Rare Metals in Peru. Eugen Weckwarth. Abstract translation. Cerium, germanium, lithium, molybdenum, rubidium, thallium, tellurium, titanium, thorium, tungsten, vanadium, and zirconia have been found. 1500 w. *Min Jour*—April 24, 1909. No. 4456 A.

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Magnitude of the Salt Industry. Gives graphical illustrations, and calculations of salt production. 1800 w. *Sci Am*—Dec. 26, 1908. No. 1292.

The Pumping of Brine, and the Manufacture of Common Salt. Philip Morris Pritchard. Describes the more usual methods of obtaining brine and of manufacturing white salt. Ills. 6500 w. *Inst of Civ Engrs*—No. 3725. No. 885 N.

The Geological Occurrence of Rock Salt in Louisiana and East Texas. G. D. Harris. Describes these deposits and their origin. Maps. 6500 w. *Ec Geol*—Jan.-Feb., 1909. No. 2716 D.

Salt Production with exhaust steam. Norman B. Beasley. Describes the evaporation of brine as practiced in Michigan. 800 w. *Eng & Min Jour*—June 5, 1909. No. 5303.

Refining Salt from the Great Salt Lakes, Utah. Leroy A. Palmer. Illustrated description of a system of pneumatic concentration. 1500 w. *Min Wld*—July 24, 1909. No. 6657.

The Rock-Salt Mining Industry in Kansas. Samuel Ainsworth. Describes the mining and milling methods employed. Ills. 2500 w. *Eng & Min Jour*—Sept. 4, 1909. No. 7566.

Notes on the Evaporated Salt Industry of Kansas. C. M. Young. Describes the operations of the Joy-Morton and the Cary companies. Ills. 3000 w. *Eng & Min Jour*—Sept. 18, 1909. No. 7824.

The Stassfurt Salt Mines in Harz Mts., Germany. Albert B. Green. Brief illustrated description. 2000 w. *Min Wld*—Jan. 16, 1909. No. 1782.

The Scherthanner Method of Opening Up Salt Mines by Means of Boreholes (Die Scherthannersche Werks-Veröffnung mit Bohrlochwässerung). Hans Vogl. Illustrated description of method of opening up rock-salt workings by leaching methods. 2700 w. *Oest Zeitschr f Berg- u. Hüttenwesen*—Dec. 19, 1908. No. 1942 D.

Leaching Brine from Salt Mines (Soleerzeugung durch Berieselung der Werksulme). Karl Schraml. Describes the methods used at Aussee, Austria. Ills.

Salt

3000 w. Oest Zeitschr f Berg- u Hüttenwesen—March 6, 1909. No. 4258 D.

Salt Deposits and Mining in German East Africa (Salzvorkommen und Salzgewinnung in Deutsch-Ostafrika). Herr Ernst. A brief review of the industry. 1800 w. Glückauf—Aug. 28, 1909. No. 7965 D.

Salt (Das Salz). A review of salt mining and production in all parts of the world. 7200 w. Glückauf—Sept. 18, 1909. No. 8665 D.

Slate.

Welsh Slate and the Penrhyn Quarry. Lionel C. Ball. Brief illustrated account of the methods at the largest slate quarry in the world. 3000 w. Queens Gov Min Jour—Jan. 15, 1909. No. 2503 B.

Sulphur.

Makushin Sulphur Deposits, Unalaska. N. Oliver Lawton. Describes the deposits of this volcanic region. Ills. 1800 w. Min & Sci Pr—Feb. 13, 1909. No. 2536.

Sulphur Mining in Mexico. Edward F. White. Describes the occurrence of the ore and the methods employed in mining and refining. Ills. 2700 w. Mines & Min—Sept., 1909. No. 7488 C.

Pyrites Mining in Scandanavia (Der skandinavische Kiesbergbau). Herr Spackeler. Describes the deposits and working of copper and iron pyrites, the production of copper and sulphur, etc. Ills. Serial. 1st part. 3600 w. Glückauf—Feb. 20, 1909. No. 3370 D.

See also Oil, under MINOR MINERALS.

Tantalum.

Tantalum and Its Industrial Applications. Alex. Siemens. Lecture at the Roy. Inst. Reviews the investigations of metallic filaments, and the experiments with tantalum, and many other ores showing its remarkable qualities. 3000 w. Nature—May 6, 1909. No. 4702 A.

Tantalum and Its Industrial Applications. Alexander Siemens. Read before the Roy. Inst. of Gt. Britain. Reviews the progress of electric lighting, dealing especially with tantalum, its use in this and other fields. 3500 w. Elec Engr, Lond—July 30, 1909. No. 6975 A.

The Properties, Metallurgy and Uses of Tantalum (Propriétés, Métallurgie et Emploi du Tantale). Pierre Breuil. The first part discusses the tantalum minerals. Serial. 1st part. 2000 w. Génie Civil—Nov. 7, 1908. No. 1121 D.

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Tellurium.

Some Observations on the Tellurides. Victor Lehner. Describes occurrence of tellurium and various laboratory experiments with tellurides. 7000 w. Ec Geol—Sept.-Oct., 1909. No. 8571 D.

Tin.

Tin—Its History, Uses and Occurrence. Arthur Lakes. Information relating to the geology and mineralogy; the history, sources, uses, &c. Ills. 2500 w. Min Wld—June 19, 1909. No. 5674.

The Origin of Tin Deposits. J. B. Scrivenor. Read before the Perak Chamber of Mines. A study based on the classification of W. H. Emmons. 3000 w. Min Jour—March 6, 1909. Serial. 1st part. No. 3161 A.

The Assay of Tin Ore. L. Parry. A criticism of methods in common use, with a review of methods proposed and used, and a description of the gas reduction assay which is said to be the most accurate. 5000 w. Min Jour—Sept. 25, 1909. No. 8350 A.

Tin in the Black Hills of South Dakota. Jesse Simmons. Brief description of the geology and development. Ills. 1500 w. Min Wld—May 15, 1909. No. 4699.

Tin Deposits of Southern South Dakota. Frank L. Hess. Abstract from Bul. No. 380, U. S. Geol. Surv. An account of the different claims, describing the deposits. 5000 w. Min Wld—Aug. 28, 1909. No. 7394.

Some Features of the Alaskan Tin Deposits. Adolph Knopf. Describes the mode of occurrence and the associated minerals, the geology, and mineralization. 3000 w. Ec-Geol—April, 1909. No. 4670 D.

Tin Deposits of the Carolinas. S. Mays Ball. Describes the tin deposits and the extent to which they have been worked. 1200 w. Eng & Min Jour—June 5, 1909. No. 5301.

Mining Operations in the Tin Mines of Cornwall. R. H. Conran. Abstract of a paper read before the Sci. Soc., Broken Hill, N. S. W. Illustrates and describes methods used. 3000 w. Min Wld—Sept. 11, 1909. No. 7711.

The Red River, Cornwall. Brief account of trouble due to tailings from the tin mines. 1000 w. Min & Sci Pr—Dec. 19, 1908. No. 1263.

The Dolcoath. Lionel C. Ball. The first of a series of illustrated articles on tin mining and milling in Cornwall, England. 3000 w. Queens Gov Min Jour—Feb. 15, 1909. Serial. 1st part. No. 3138 B.

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MINOR MINERALS

Tungsten

The Bessemerizing of Hardhead. Donald M. Levy and D. Ewen. Gives the scope of research work with this waste product of tin smelting, and a summary of the experiments. 2500 w. *Inst of Min & Met*, Bul. 56—May 13, 1909. No. 5602 N.

The London Tin Market in 1908. A review by months. 3000 w. *Eng & Min Jour*—Jan 23, 1909. No. 2034.

Tin Mining and Milling in North Queensland. G. W. Williams. Notes on these tinfields, and the need of modern methods to develop the lowgrade ores. 2500 w. *Eng & Min Jour*—May 29, 1909. No. 5163.

Present Position of Bolivian Tin Mines. Gilmour E. Brown. Information concerning the present condition of the tin mining industry. 1000 w. *Min Jour*—March 27, 1909. No. 3784 A.

Tin Mining in Bolivia (Unterlagen zu einer bergmännischen Lagerstättenbegutachtung im bolivianischen Zinnerzbezirk). Herr Everding. A general review of conditions, practice, etc. 8000 w. *Glückauf*—Sept. 11, 1909. No. 8663 D.

The Tin Mines of Llallagua, Near Oruro, Bolivia. Augusto Endter. Abstract translation describing the geology, vein structure and mining. 1500 w. *Min Jour*—July 10, 1909. No. 6609 A.

The Occurrence of Stannite in Australasia. Hartwell Conder. Information, with analysis and methods of treatment. 1800 w. *Aust Min Stand*—Nov. 18, 1908. No. 1095 B.

Mining in the Malay States. E. Seaborn Marks. An illustrated account of this mining region which produces over 60% of the world's tin supply. 4000 w. *Min & Sci Pr*—Jan. 2, 1909. No. 1630.

Tin in Pérak (L'Etain dans l'Etat de Pérak). L. Giraud. An exhaustive review of the deposits, their history, mining, ore dressing, etc. Ills. 23000 w. *Mem Soc Ing Civ de France*—Jan., 1909. No. 4202 G.

Mount Bischoff Tin M. Co., Tasmania. J. D. Millen. Illustrates and describes the hydro-electric plant for supplying electric power for mine, mills, and electric traction. 2200 w. *Aust Min Stand*—March 10, 1909. Serial, 1st part. No. 3988 B.

Stanley River Tin Field, Tasmania. Hartwell Conder. Sketch plan and brief description of this field, with which communication has been established. 1200 w. *Aust Min Stand*—June 16, 1909. No. 6863 B.

The Origin of the Bolivian Tin Deposits. William R. Rumbold. Aims to

show that the popular idea of the origin of these deposits is erroneous, and that the majority of the deposits may be attributed to the same causes which have produced the other tin deposits of the world. Ills. 8000 w. *Ec-Geol*—June, 1909. No. 6743 D.

King of the Ranges Tin Mine, Watsonville, N. Q. Lionel C. Ball. Information in regard to the workings and the geology 4000 w. *Queens Gov Min Jour*—May 15, 1909. No. 5820 B.

Recovery of Tin from Alluvial Deposits. H. G. Trenchard. Notes on steam sluicing plants at Tingha (N. S. W.) 3000 w. *Aust Min Stand*—Jan. 13, 1909. No. 2505 B.

The Origin of the Tin Ores of the Rooiberg District, Transvaal. Information from a recent paper by Mr. Recknarel, published in the *Trans. of the Geol. Soc. of S. Africa*. 1200 w. *Min Jour*—Dec. 19, 1908. No. 1530 A.

See also same title, under ORE DRESSING AND CONCENTRATION; and Tasmania, under GOLD AND SILVER.

Trass.

The Genesis, Mining and Uses of Trass (Der Trass, seine Entstehung, Gewinnung und Bedeutung im Dienste der Technik). Herr Hambloch. Ills. 6600 w. *Zeitschr d Ver Deutscher Ing*—April 24, 1909. No. 5079 D.

Tripoli.

Tripoli Deposits at Seneca, Missouri. Gaylord Nelson. Describes these deposits, discussing their origin, methods of mining, etc. 1500 w. *Min Wld*—Sept. 11, 1909. No. 7712.

Tungsten.

Occurrence and Utilization of Tungsten Ores. A résumé of information available on this subject. 5500 w. *Bul Imp Inst*—Vol. VII. No. 2. Serial. 1st part. No. 8033 N.

Tungsten: Its Uses and Geological Occurrence. T. L. Walker. Abstracted from report made to the Dept. of Mines, Canada. Describes the chief tungsten ores and general chemical tests, their occurrence and concentration. 3000 w. *Min Wld*—Sept. 11, 1909. No. 7710.

Report on the Tungsten Ores of Canada. T. L. Walker. General review of the metal and its uses, ores, occurrence, tests, distribution, etc. Ills. 13500 w. *Canada Dept of Mines*—No. 25. No. 7782 N.

Tungsten Ore Deposits of the Coeur d'Alene. Herbert S. Auerbach. Undeveloped

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oped deposits carrying 25% tungsten trioxide are described. Schultite occurs associated with gold, silver, lead, iron, and copper. 2000 w. Eng & Min Jour—Dec. 12, 1908. No. 963.

Tungsten Deposits and Surface Enrichment. Gordon Surr. Describes tungsten deposits, and discusses the possibility of secondary enrichment. 3000 w. Min Wld—Jan. 2, 1909. No. 1444.

Tungsten in Colorado. H. R. Wagenen. The Frenzel prize thesis. Discusses its occurrence, mill practice, production, etc., its physical properties, uses, mineralogy, chemistry and other topics. 13500 w. Qr of Colorado Sch of Mines—April, 1909. No. 4741 N.

The Determination of Tungstic-Acid in Low Grade Ores. Abstract of a paper describing the aqua regia method, aqua regia with previous treatment with hydrofluoric acid, and fusion with alkalis and subsequent determination with mercurous nitrate. 1500 w. Eng & Min Jour—June 5, 1909. No. 5302.

The Determination of Tungstic Acid in Low-Grade Wolfram Ores. H. W. Hutchinson. Describes a new method, claiming advantages in time, accuracy, and general utility. 4000 w. Inst of Min & Met, Bul 56—May 13, 1909. No. 5600 N.

Wolfram Ores—Occurrences and Uses. Charles Bogenrieder. Discusses their importance in Australia and to commerce in general. 1000 w. Aust Min Stand—Nov. 18, 1908. Serial. 1st part. No. 1090 B.

Turquoise.

Turquoise Mining, Burro Mountains, New Mexico. Edward R. Zalinski. Notes on how turquoise is mined, and a review of the geological features. Ills. 3500 w. Eng & Min Jour—Oct. 31, 1908. No. 15.

MINING

Uranium.

Uranium Mining. Information concerning the mining of the ore and how radium is obtained from it. 1200 w. Sci Am Sup—March 6, 1909. No. 3578.

The Radioactivity of the Raw Materials and Middle and End Products of the Imperial Uranium Dye Works at St. Joachimstahl (Ueber die Radioaktivität der in der k. k. Uranfarbenfabrik zu St. Joachimstahl erzeugten Roh- Zwischen- und Endprodukte). Josef Step. An account of investigations. Ills. Serial, 1st part. 2200 w. Oest Zeitschr f Berg- u Hüttenwesen—March 13, 1909. No. 4259 D.

Uranium Ores (Die Uranerze). A brief review of the uranium minerals. 2000 w. Oest Zeitschr f Berg u Hüttenwesen—May 15, 1909. No. 5753 D.

See also Vanadium, under MINOR MINERALS.

Vanadium.

Vanadium-Deposits in Peru. D. Foster Hewett. Describes two districts where deposits of vanadium have been found and investigation of the nature of the deposits. Ills. 5500 w. Bul Am Inst of Min Engrs—March, 1909. No. 3472 F.

Vanadium-Deposits in Peru. Discussion of the paper of D. Foster Hewett. 800 w. Bul Am Inst of Min Engrs—Oct., 1909. No. 8746 F.

Vanadium: Occurrence and Uses. Henry E. Ede. Brief note on the discovery of this element, discussing the vanadium ores, and the uses of the metal. 1500 w. Min Jour—Sept. 25, 1909. No. 8349 A.

Uranium and Vanadium Metallurgy. Justin H. Haynes. History and description of the process used to separate the minerals from their ores. 2500 w. Mines & Min—Oct., 1909. No. 8255 C.

MINING

Accidents.

Prevention of Accidents in Metal Mines. Claude T. Rice. Calls attention to many preventable accidents due to carelessness. 6500 w. Eng & Min Jour—Feb. 6, 1909. No. 2317.

The Disasters at the Mount Morgan Mine, Queensland. The report of the Board of Inquiry, describing the mine and methods, recent accidents and their causes with recommendations. 7500 w. N Z Mines Rec—Feb. 16, 1909. No. 3885 B.

See also Law, under MINING.

Accounting.

Mining Accounts. Dwight B. Huntley. A lecture delivered before the Mining Assn. of the Univ. of Cal. on the keeping of mining accounts. 4500 w. Cal Jour of Tech—April, 1909. No. 4761.

Mine Accounting. John G. Grant. The first of a series of articles dealing with book-keeping for mining companies. 2500 w. Can Min Jour—Feb. 15, 1909. Serial, 1st part. No. 2551.

Mine Accounting in the Ruhr District (Die im Ruhrbergbau üblichen Methoden

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Air Compression

der Selbstkostenberechnung). Herr Reckmann. An exhaustive description of the cost keeping methods in this coal district. Ills. Serial, 1st part. 6000 w. Glückauf—Jan. 2, 1909. No. 2675 D.

Air Compression.

See same title, under MECHANICAL ENGINEERING, POWER AND TRANSMISSION.

Blasting.

Electric Shot-Firing in Coal Mines. D. Harrington. Discusses a system installed in Utah where all shots are fired from the surface after the workings are clear of men. Ills. 4000 w. Eng & Min Jour—Jan. 30, 1909. No. 2172.

The Theory of Blasting with High Explosives. E. M. Weston. Gives results of the writer's study of this subject. 8000 w. Jour Chem, Met, & Min Soc of S Africa—Oct., 1908. No. 1085 E.

The Gases Resulting from the Use of High Explosives. William Cullen. The effect of explosives on the atmosphere of mines, giving results of experiments and points bearing on mine ventilation. 7800 w. Jour Chem, Met & Min Soc of S Africa—Nov., 1908. No. 1801 E.

The Theory of Blasting with High Explosives. Interesting contributions to the discussion of E. M. Weston's paper. 9500 w. Jour Chem Met & Min Soc of S Africa—Dec., 1908. No. 2708 E.

Boring.

Churn Drills in Ely District. J. L. Dobbins. Illustrates and describes the prospecting with these drills on the ground of the Nevada Consolidated Copper Co. 2200 w. Mines & Min—June, 1909. No. 5248 C.

Prospect Drilling in the Joplin District, Missouri. Doss Brittain. An account of prospecting with the churn drill. 2200 w. Min Wld—Feb. 13, 1909. No. 2443.

The Choice of Boring Methods, with Reference to Their Applications, Capacity and Cost (Die wahl des Bohrsysteme unter Berücksichtigung ihres Anwendungsgebietes, ihrer Leistungsfähigkeit und Anschaffungskosten). Anton Pois. Serial, 1st part. 1800 w. Oest Zeitschr f Berg- u Hüttenwesen—March 27, 1909. No. 4260 D.

See also same title, under CIVIL ENGINEERING, CONSTRUCTION.

Caving System.

Change of Method in Mining Soft Ore. Stuart Rhett Elliott. Describes the conditions and the caving system of mining adopted. Ills. 1500 w. Min & Sci Pr—July 17, 1909. No. 6628.

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Drilling

Cananea Caving and Slicing Systems. R. L. Herrick. Describes the ore-bodies and methods of mining which have resulted in very low costs. Ills. 9800 w. Mines & Min—Aug., 1909. No. 6884 C.

Costs.

See same title, under COPPER.

Deep Level.

Suggestions for Modern Deep Level Mining. H. H. Johnson and H. F. Roche. Gives an outline of the writer's views on the surface equipment only, in the present article. General discussion. Ills. 4500 w. Jour S African Assn of Engrs—March, 1909. No. 4445 A.

Development.

The Development of a Mine. Discusses points to be observed in development of a mine of payable ore. 3300 w. Aust Min Stand—Sept. 1, 1909. No. 8825.

Diamond Drilling.

Important Features of Diamond Core Drilling. C. J. McCord. Presents unusual features of the work. Ills. 4500 w. Min Wld—Jan. 2, 1909. Serial. 1st part. No. 1442.

Diamond Drilling at Tonopah. John M. Fox. Outlines the equipment and labor and describes the progress of the work, costs, etc. 2000 w. Min & Sci Pr—Aug. 21, 1909. No. 7374.

Notes on Diamond Drilling at the Michigan Copper Mine, Rockland, Mich. Clarence M. Haight. Detailed account of the work, with condensed summary and analysis including costs. 1200 w. Sch of Mines Qr—July, 1909. No. 7890 D.

See also Prospecting, under MINING.

Drainage.

Comstock Drainage Problems. Leon M. Hall. A review of past and present equipment. Ills. 2200 w. Min & Sci Pr—July 3, 1909. No. 6199.

The Comstock Mines To-day. Whitman Symmes. An illustrated explanation of the present policy being pursued in unwatering the mines. 1500 w. Min & Sci Pr—July 3, 1909. No. 6198.

Drilling.

Practical Points for Operating the Banka Drill. J. Chisholm. Illustrated notes, describing its use in prospecting in British Guiana. 2500 w. Min Jour—Feb. 20, 1909. No. 2890 A.

Mechanically Operated Rock Drills with Special Reference to Tunnel Boring in the Alpine Tunnels (Ueber maschinell betriebene Gesteinsbohrungen mit be-

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sonderer Berücksichtigung des Stollen-vortriebes in den Alpentunnels). Otto Schneller. Describes the various types used and gives results. Ills. Serial. 1st part. 5000 w. Zeitschr d Oest Ing u Arch Ver—Feb. 26, 1909. No. 3398 D.

Machine Drilling and Blasting (Maschineller Bohrbetrieb und Zeitzündung). V. Lipold. Describes a new Siemens & Halske fuse and gives comparative costs of breaking ground by hand and machine drilling. Ills. 2000 w. Oest Zeitschr f Berg u Hüttenwesen—Aug. 21, 1909. No. 7962 D.

See also Prospecting, under MINING.

Drills.

Comparative Tests of Large and Small Hammer Rock-Drills. J. B. Lippincott. Gives description of tests, with tabulated results. 800 w. Eng News—April 22, 1909. No. 4166.

Selection and Use of Bits for Power Drills. M. de Gennes. Discusses the different types and the effect of size, shape, and cutting edge on the results. 1500 w. Eng & Min Jour—June 12, 1909. No. 5476.

Surface Trials in Rand Stope Drill Competition. Eustace M. Weston. Report of results of trials held under the auspices of the Transvaal government. 2500 w. Eng & Min Jour—May 15, 1909. No. 4685.

Ways of Improving Piston and Hammer Drills. Eustace M. Weston. Discusses the comparative merits of hammer and piston drills, suggesting the use of heavier steel, a shorter and quicker stroke, better lubrication, etc. 4000 w. Eng & Min Jour—March 13, 1909. No. 3119.

Drill Sharpening.

Calumet and Hecla Drill-Sharpening Device. C. L. C. Fichtel. Illustrated description of a plant that handles about 4000 drills a day. 1200 w. Eng & Min Jour—May 29, 1909. No. 5157.

Dry Houses.

Examples of Modern Sanitary Dry Houses. Albert H. Fay. Illustrates and describes the change houses used by the Oliver Iron Mining Co. 1200 w. Eng & Min Jour—Oct. 23, 1909. No. 8728.

Earth Pressures.

The Causes of Extraordinarily High Earth Pressures in the Zwickau District and their Effects on the Shafts and Galleries (Die Ursachen des aussergewöhnlich hohen Gebirgsdruckes in einem Teile des Zwickauer Reviers und seine Wirkung auf die Schachte und Füllörter). Dr. Niess. Ills. 5000 w. Glückauf—May 29, 1909. No. 5760 D.

MINING

Earth Settlement.

See Track Construction, under STREET AND ELECTRIC RAILWAYS.

Education.

See same title, under INDUSTRIAL ECONOMY.

Electric Hoisting.

Electric Hoists as Adapted for Coal Mines. R. H. Rowland. Discusses the advantages of electric winding and compares the most approved equalizing systems. 3500 w. Eng & Min Jour—Feb. 27, 1909. No. 2859.

Operation of Mine Hoists by Electric Motors. C. V. Allen. Illustrated description, with special reference to the installation of the El Oro Mining and Railway Co., Ltd., 2000 w. Elec Jour—June, 1909. No. 5546.

Electrical-Winding in South Wales. Illustrated description of the installation at the Maritime pit of the Great Western Colliery Co. 2000 w. Elec Rev, Lond—Jan. 1, 1909. No. 1693 A.

Electric Winding at the Ferndale Collieries. Illustrated description of the winding machinery installed. 2500 w. Ir & Coal Trds Rev—Oct. 15, 1909. No. 8960 A.

Losses in the Ilgner Hoisting System and Determination of the Most Economical Slip of Its Starting Motors (Verluste bei Ilgner-Förderanlagen und Bestimmung der wirtschaftlichsten Schlüpfung ihrer Anlassmotoren). L. Becker. Mathematical and theoretical. Ills. 2000 w. Elektrotech Zeitschr—Dec. 24, 1908. No. 2115 D.

Load Compensation for Hoisting Machines and Rolling Mills (Belastungsausgleich bei Fördermaschinen und Walzwerken). Josef Blazek. Discusses electrical systems of load equalization. Ills. Serial. 1st part. 1500 w. Oest Zeitschr f Berg u Hüttenwesen—Aug. 14, 1909. No. 7961 D.

Electric Generating and Hoisting Plants at the Friedrichshall Potash Mines (Elektrische Zentrale und Schachtförderanlage der Kaliwerke Friedrichshall). M. Henke. Illustrated description. 2600 w. Glückauf—Feb. 20, 1909. No. 3371 D.

Electric Hoisting Plants (Elektrische Ophaalwerktuigen). J. H. D. Wagener. Describes the installation at the Wilhelmina mine in Holland. Ills. 6000 w. De Ingenieur—March 27, 1909. No. 4377 D.

Electric Hoist at the Elisabeth Collieries, Baulet, Belgium (Machine d'Extraction électrique des Charbonnages Elis-

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abeth, à Baulet, Belgique). Illustrated description. 3700 w. Génie Civil—Feb. 27, 1909. No. 3346 D.

Electric Power.

The Installation of Electricity in Mines. W. A. Thomas. Deals with the manner of installation and operation of electric conductors and apparatus in underground workings. 3000 w. Pro Am Min Cong—1908. No. 4135 N.

Electrical Wiring for Deep Mining Work. Carl L. C. Fichtel. The mechanical and electrical features are considered. 2200 w. Eng & Min Jour—Sept. 11, 1909. No. 7683.

Notes on Electric Practice in Mines. W. O. Pepper. Considers briefly the power house, cables, switchboards, transformers, coal cutters, winding, &c. 2000 w. Elec Rev, Lond—Oct. 8, 1909. No. 8863 A.

Electricity in Mines (L'Electricité dans les Mines). Albert Rigaux. The first part discusses the generation and distribution of electrical energy. Ills. Serial. 1st part. 7500 w. Bul Sci d l'Assn des Elèves—March, 1909. No. 4806 D.

Electrical Power at Mexican Mines and Mills. Charles V. Allen. Illustrated descriptions of a number of installations. 1500 w. Eng & Min Jour—Oct. 2, 1909. No. 8278.

Electricity in Mines. T. J. McKavanagh. Read before the Min. Soc. of Nova Scotia. A review of modern and economical applications of electricity to mining. 2500 w. Can Min Jour—April 1, 1909. No. 3764.

The Direct-Current Motor in Mining Service. C. S. McGinnis. Considers troubles most likely to occur in practice and remedies which will dispose of the "inductive kick." Diagrams. 1500 w. Min Wld—March 27, 1909. No. 3544.

New A. C. Single-Phase Motors and their Application to Mining Work (Neuere Einphasenwechselstrommotoren und ihre Anwendbarkeit im Bergbau). Herr Spackeler. The first part discusses series motors. Ills. Serial, 1st part. 2700 w. Glückauf—July 17, 1909. No. 7275 D.

Switchboards for Mine Power Plants. W. B. Clarke. Considers the equipment desirable and the reasons for certain arrangements. 3000 w. Mines & Min—Nov., 1908. No. 32 C.

See also Exhibitions, Mine Regulations, and Quarrying, under MINING; Germany, under COPPER; and Accumulators, and Central Stations, under ELECTRICAL ENGINEERING, GENERATING STATIONS.

MINING

Engineering Ethics

Professional Ethics. John Hays Hammond. The relation of the mining engineer to employers, to the public, and to personal interest. 3000 w. Bul Am Inst of Min Engrs—Nov., 1908. No. 690 C.

Exhibitions.

Manchester Electrical Exhibition. The first of a series of illustrated articles describing especially the exhibits dealing with mining and quarrying. 3000 w. Col Guard—Nov. 6, 1908. Serial, 1st part. No. 318 A.

Exploration.

The Recovery of an Ore Body or Lost Vein. Arthur Lakes. Describes the mode of procedure and difficulties encountered in such work. Ills. 2000 w. Min Wld—Aug. 21, 1909. No. 7189.

Explosives.

Principles and Compositions of Explosives. A. L. Hodges. An explanation of the principle, and a discussion of the composition of the most used explosives. 2800 w. Min Wld—Sept. 4, 1909. No. 7548.

Accidents from Use of Explosives. Jared W. Stark. Prize paper. Discusses proper methods of storing, transporting, loading and firing explosives. 4000 w. Mines & Min—March, 1909. No. 2058 C.

Twenty Years' Progress in Explosives. Oscar Guttman. A review of progress giving information concerning their manufacture, composition, etc. 5500 w. Jour Soc of Arts—Dec. 25, 1908. Serial. 1st part. No. 1503 A.

Standardization of Blasting Explosives. M. B. Lloyd. Read before the Int. Cong. of Ap. Chem. Presents the desirability of standardization, and outlines a system. 700 w. Col Guard—June 11, 1909. No. 5655 A.

Report to the International Commission on the Unification of the Methods of Testing the Stability of Explosives. V. Watteyne and S. Stassart. From report presented to the Congress of Applied Chemistry. 1600 w. Col Guard—July 9, 1909. No. 6421 A.

See also same title, under COAL AND COKE; Mine Gas, under MINING; and Explosives, under RAILWAY ENGINEERING, TRAFFIC.

Finance.

The Better Protection of Mine Investors. H. S. Munroe. Briefly considers prospecting, development and working, and the information that a company report should contain. 1500 w. Min Wld—Nov. 14, 1908. Serial, 1st part, No. 279.

MINING AND METALLURGY

Gas Power

Gas Power.

Suction Gas and Its Application to Mining. George D. Stephen. Describes an installation in Cumberland, England. 2000 w. Eng & Min Jour—May 29, 1909. No. 5158.

Geological Records.

Recording Geological Data. Thorald F. Field. Explains methods used by the Calumet & Arizona Mining Co. Ills. 1200 w. Mines & Min—Aug., 1909. No. 6882 C.

Gravity Planes.

Self-Acting Top for Gravity Plane. H. McKean Conner. Illustrated description of a device by which cars may be delivered and received on tracks of different grades. 800 w. Mines & Min—Sept., 1909. No. 7494 C.

Haulage.

Gravity Planes. A. W. Evans. Illustrates and describes track and haulage arrangements in use in Pennsylvania, Virginia, Kentucky and Tennessee. 2000 w. Mines & Min—April, 1909. No. 3674 C.

The Mosgrove Incline. William L. Afelder. Describes the method of construction used to avoid common defects. Of interest to coal operators. 1200 w. Mines & Min—Jan., 1909. No. 1415 C.

A New Departure in the Hauling of Coal at the Working Face. Illustrates and describes a new method, using swing conveyors, in successful operation at the Rheinpreussen Colliery, in Westphalia. 2500 w. Ir & Coal Trds Rev—March 12, 1909. No. 3432 A.

Some Economies in Underground Ore Haulage. G. E. Walcott. Discusses how to lay tracks, how to run a drift, switching devices, etc. Diagrams. 3000 w. Min Wld—Oct. 31, 1908. No. 37.

An Electric Colliery Railway. Illustrated description of an installation at Chopwell Colliery, England. 1700 w. Elec Engng—Oct. 22, 1908. No. 70 A.

New Hauling Station, Great Boulder Mine, W. A. Illustrated description of a new station at Kalgoorlie, W. A. 1800 w. Aust Min Stand—Dec. 9, 1908. No. 1893 B.

Underground Electrical Haulage. Information concerning the success of electric haulage in the Victoria deep leads. Ills. 1800 w. Aust Min Stand—Feb. 17, 1909. No. 3589 B.

Haulage with Compressed-Air Locomotives in the Emo Mine of the Cologne Mining Company (Die Druckluft-Lokomotivförderung unter Tage auf den Em-

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scherschächten des Kölner Bergwerks-Vereins). D. Winkhaus. Describes the equipment and methods and gives costs of operation and maintenance. Ills. 2500 w. Glückauf—Nov. 28, 1908. No. 1154 D.

Electrically Operated Slag Railway of the Alpine Mining Company, Donawitz, Austria (Elektrisch betriebener Haldenaufzug der österreichischen Alpen Montangesellschaft in Donawitz). Illustrated description of this electrically operated rope-haulage plant. 1500 w. Oest Zeitschr f Berg-u Hüttenwesen—Dec. 12, 1908. No. 1948 D.

See also Electric Power, under COAL AND COKE; and Coal Handling, and Ore Handling, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING.

Head Frames.

Stresses in Hoisting Ropes and the Design of Mine Headgears. Robert Boyle. Drawings and discussion. 11700 w. Scottish Inst of Min Students—May 16, 1908. No. 4758 N.

Design and Construction of Head Frames (Calcul et Construction des Cages d'Extraction). N. Dessart. Discusses a number of types. Ills. 10000 w. All Indus—Sept., 1909. No. 8620 D.

Hoisting.

Rope Strains in Hoisting. C. W. Beers. Gives a quick method of calculating rope strains in hoisting on any pitch. 600 w. Eng & Min Jour—Aug. 21, 1909. No. 7185.

Counterbalanced Hoisting. R. L. Herick. Illustrates and describes ingenious devices used in Colorado mines which result in economy of power. 3300 w. Mines & Min—May, 1909. No. 4477 C.

Friction Drums and Brakes. Warren O. Rogers. Illustrates and describes types of these devices as used in hoisting-engine practice, showing how they are constructed and applied. 1500 w. Power—Oct. 26, 1909. No. 8772.

Automatic Cage Tub Stops. Illustrates and describes the "Winter" tub stop. 1500 w. Ir & Coal Trds Rev—Oct. 15, 1909. No. 8961 A.

Dynamics of Colliery Winding Ropes, Cages, Guide Ropes, and Tubs. A. Hanley. Read before the Nat. Assn. of Col. Mgrs. Illustrated discussion of methods of testing and description of the author's inventions. 2500 w. Ir & Coal Trds Rev—Jan. 15, 1909. No. 2086 A.

Devices for Greasing Winding Ropes and Cage Guides. O. Döbelstein, in Glückauf. Illustrated detailed description. 1200 w. Col Guard—Jan. 29, 1909. No. 2357 A.

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Bennett's Patent Safety Rope Detaching Gear and Cage Retainer. Illustrated description of a safety retaining gear to prevent overwinding. 1200 w. Col Guard—March 19, 1909. No. 3614 A.

The Lubrication of Winding Ropes and Cage Guides (Neuerungen bei der Förderseil und Spurlattenschmierung). O. Döbelstein. Illustrates and describes recent oiling devices. 2000 w. Glückauf—Jan. 2, 1909. No. 2674 D.

Stresses and Vibrations in Hoisting Ropes under Variable Acceleration (Seilspannungen und -schwingungen bei Beschleunigungs-änderungen des Schachtförderseiles). A. Stör. Mathematical. Ills. Serfal, 1st part. 5000 w. Oest Zeitschr f Berg- u Hüttenwesen—July 3, 1909. No. 7267 D.

The Influence of the Use of Back Steam for Shortening Hoisting Time on the Steam Consumption of Hoisting Engines (Der Einfluss der Fahrt mit Gegenampf zur Verkürzung der Fahrzeit auf den Dampfverbrauch von Fördermaschinen). Herr Moritz. Discusses an actual experience. Ills. 2000 w. Glückauf—Oct. 10, 1908. No. 554 D.

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Hoisting Engines.

Three Thousand Horse Power Winding Engine. J. B. Van Brussel. Illustrates detailed description of a high pressure type. 800 w. Eng & Min Jour—May 1, 1909. No. 4386.

Electric Hoisting Equipment at Winona, Mich. R. R. Seeber. Illustrated description of Ilgner fly-wheel motor generator set, with Ward Leonard control. 1500 w. Eng & Min Jour—July 17, 1909. No. 6391.

Automatic Throttle-Closing Device for Hoisting Machinery. Spencer S. Rumsey. Describes an invention in use at the mines of the Oliver Iron Mining Co. 1500 w. Mines & Min—Jan., 1909. No. 1416 C.

An Electrically Operated Hoisting Plant. A. Gradenwitz. Illustrated description of a scheme devised to eliminate the fly-wheel converter. 1500 w. Eng & Min Jour—July 10, 1909. No. 6251.

A Twin Tandem-Compound Drop-Valve Winding Engine. Illustrated description of engine built in Germany. 1200 w. Engr, Lond—Dec. 11, 1908. No. 1222 A.

The Mechanics of Ilgner-Operated Winding-Engines. Considers advantages of electrical operation of rolling-mill plants and winding-engines, and explains the scheme of operation. 2200 w. Engng—June 18, 1909. No. 6039 A.

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The Debauche Light Automatic Brake for Hoisting Engines (Frein léger à Action variable applicable aux Machines d'Extraction). Illustrated detailed description. 2000 w. Rev de Mécan—Jan., 1909. No. 2625 E + F.

A New Safety Device for Steam Hoisting Engines (Eine neue Sicherheitsvorrichtung für Dampffördermaschinen). G. Schönfeld. Illustrated detailed description of an automatic stop. 2200 w. Glückauf—Jan. 23, 1909. No. 2678 D.

Test of a Steam Hoisting Engine and an Exhaust-Steam Turbo-Generator in Connection with It (Untersuchung einer Dampffördermaschine sowie einer damit verbundenen Abdampf-Turbogeneratorenanlage auf Zeche Prosper II). Ills. 1800 w. Glückauf—Sept. 25, 1909. No. 8667 D.

See also Machinery, under MINING.

Hoisting Ropes.

Stresses on Winding and Conducting Ropes as Used in Mine Shafts. Joseph Hindley and John Stoney. Read before the Manchester Geol. & Min. Soc. Gives plan and description of a stress indicator. 1500 w. Ir & Coal Trds Rev—Dec. 18, 1908. No. 1382 A.

Notes on Corrosion, with Special Reference to the Corrosion of Steel Winding Ropes. M. Thornton Murray. Gives a summary of theories of corrosion at present in vogue and especially considers the corrosion of winding ropes. Ills. 4500 w. Jour Chem, Met & Min Soc of S Africa—Aug., 1909. No. 8828 E.

Hydraulic Filling.

See same title, under CIVIL ENGINEERING, CONSTRUCTION.

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See same title, under GOLD AND SILVER.

Labor.

Arbitration as a Factor in the Mining Industry. Two papers on this subject by Judge George Gray, and by Thomas L. Lewis. 3000 w. Pro Am Min Cong—1908. No. 4138 N.

The Importance of Arbitration as a Factor in the Advancement of the Mining Industry. Hon. Carroll D. Wright. Shows the benefits of this method of adjusting difficulties. 1800 w. Pro Am Min Cong—1908. No. 4120 N.

Labor Efficiency in Mining Operations. Peter B. Scotland. Discusses some of the factors that contribute toward efficiency. 1200 w. Eng & Min Jour—Sept. 11, 1909. No. 7685.

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Mine Labor and Supplies in Mexico. Mark R. Lamb. An explanation of labor conditions and description of how the work is done. Ills. 2000 w. Eng & Min Jour—Dec. 26, 1908. No. 1274.

The Kaffir Mine Laborer. Thomas Lane Carter. An account of conditions in South Africa, the mental and physical capabilities of the natives, their customs and their economic value as laborers. Ills. 10800 w. Bul Am Inst of Min Engrs—Nov., 1908. No. 681 C.

White Labor in Mining. Tom Johnson. Considers the subject from the viewpoint of conditions in South Africa. 2500 w. Jour Chem, Met, & Min Soc of S Africa—Jan., 1909. No. 3144 E.

See also Mexico, under MISCELLANY.

Law.

Prevention of Mine Accidents. Investigations made by a committee appointed by the Am. Min. Cong. shows that only four states have comprehensive laws regulating metalliferous mining. 13000 w. Eng & Min Jour—Dec. 5, 1908. No. 913.

Assessment Work on Mining Claims. William E. Colby. A brief explanation of the nature of the annual labor required by the U. S. mining laws. 2000 w. Min & Sci Pr—Dec. 12, 1908. No. 1066.

New Laws Governing Mining in Idaho. Gives the revised laws. 2200 w. Min Wld—Aug. 7, 1909. No. 6934.

Synopsis of the New Mining Laws of Mexico. M. C. Little. A digest of the new bill recently passed. 5000 w. Min Wld—July 3, 1909. No. 6142.

Australian Mineral Leasing. A. C. Veatch. Summarizes recent mining enactments, all of which are based on the policy of mineral leasehold. An address delivered before the Conservation Commission, Dec. 3, 1908. 2400 w. Eng & Min Jour—June 5, 1909. No. 5298.

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Leasing in Cripple Creek District. C. W. Burgess. A thesis submitted at graduation from the Colo. Sch. of Mines. Information regarding the district, with discussion of the advantages of leasing vs. company operation. 7500 w. Mines & Min—Aug., 1909. No. 6881 C.

Leasing System.

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Locomotives.

Compressed Air Mine Locomotives. Illustrated description of a locomotive introduced by the Berliner Maschinenbau-Aktiengesellschaft, to be driven by com-

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pressed air. 700 w. Ir & Coal Trds Rev—Dec. 4, 1908. No. 1027 A.

See also Haulage, under MINING.

Machinery.

The Management of Mining Machinery (Maschinenwirtschaft in Bergwerken). H. Hoffmann. Discusses the installation, operation, and care of pumping, hoisting, compression and other machinery. Ills. Serial, 1st part. 5500 w. Zeitschr d Ver Deutscher Ing—Jan. 2, 1909. No. 2832 D.

Lowering a Large Pump into a Mine. George J. Young. Illustrated description of method employed at the Ward shaft, Virginia City, Nevada. 800 w. Eng & Min Jour—April 17, 1909. No. 4008.

Management.

A Labor Chart for the Management of Mining and Milling Operations. Joseph Macdonald. Gives the labor chart used for the Guanajuato Consolidated Mining & Milling Co., with explanatory notes. 900 w. Bul Am Inst of Min Engrs—Jan., 1909. No. 2424 F.

The Practical Mine Manager and Engineering. Abstract of a lecture by James B. Lewis, in the Melbourne University course. 2500 w. Aust Min Stand—Feb. 10, 1909. No. 3141 B.

Methods.

Modern Progress in Mining and Metallurgy in the Western United States. David W. Brunton. Presidential address giving an outline of recent improvements and the present situation. 7000 w. Bul Am Inst of Min Engrs—Sept., 1909. No. 8196 F.

Mining and Metallurgy in Western United States. David W. Brunton. Abstract of presidential address to the Am. Inst. M. E., at Spokane. On recent and important improvements in mining practice. 6500 w. Min Wld—Sept. 25, 1909. No. 8083.

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An Improved Type of Mine Car Wheel. J. E. Johnson, Jr. Descriptive. 1500 w. Eng & Min Jour—June 12, 1909. No. 5475.

Mine Dams.

Protection of the Vereinigte Engelburg Colliery against the Rising Water in the Idle Vereinigte Maria Anna and Steinbank Colliery (Die Sicherung der Zeche Vereinigte Engelsburg gegen die hoch-

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gehenden Wasser der stillgelegten Zeche Vereinigte, Maria Anna und Steinbank) Herr Battig. Illustrated description of the protection works. 2600 w. Glückauf—Feb. 6, 1909. No. 3369 D.

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Mine Examination.

The Professional Examination of Undeveloped Mineral Properties. Charles Catlett. Suggestions in regard to examinations and reports. 3500 w. Bul Am Inst of Min Engrs—March, 1909. No. 3474 F.

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The Estimation of Carbon Monoxide in Mine Gas. E. H. Weiskopf. Explains the method of sampling mine air, and considers the effects of explosions, the methods of firing, and the nature and composition of the explosive. 5000 w. Jour Chem, Met & Min Soc of S Africa—Feb., 1909. No. 4022 E.

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Mine Inspection. Courtenay De Kalb. Address presented at the Am. Min. Cong. Considers it should be solely that of police regulation with the object of preserving health and property. 2000 w. Min & Sci Pr—Oct. 9, 1909. No. 8734.

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Acetylene Mine-Lamps. A. Cressy Morrison. Information concerning their use and cost. 1000 w. Min & Sci Pr—Jan. 23, 1909. No. 2129.

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Importance of Acetylene in Mine Operations. Robert Grimshaw. Abstract translation of paper by Herr R. Penkert, in *Kohle und Erz*. Ills. 2500 w. Min Wld—Oct. 16, 1909. No. 8711.

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The Importance of Proper Underground Maps. Thomas E. Fisher. Suggestions for making accurate maps of underground workings. Ills. 2000 w. Min Wld—July 10, 1909. No. 626e.

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Electricity Rules in New South Wales Mines. Gives text of special rules established in most of the large collieries where electrical installations exist. 7000 w. Ir & Coal Trds Rev—Sept. 3, 1909. No. 7761 A.

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Geologic Essentials of a Mine Report. Courtenay De Kalb. An address before the Geol. Soc. of Stanford Univ. A discussion of the essential points and other related topics. 4500 w. Min & Sci Pr—May 1, 1909. No. 4529.

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The Cactus Club at the Newhouse Mines, Utah. Lafayette Hanchett. An account of a cooperative organization controlled by the mine employees which has proved successful. Ills. 800 w. Eng & Min Jour—Dec. 19, 1908. No. 1046.

Mine Sampling

Sampling and Assaying the Copper Ores of the Ely District. Robert Marsh, Jr. On the value and cost of drilling work in developing low-grade ores. 2000 w. Sch of Mines Qr—Jan., 1909. No. 2751 D.

Development Sampling and Ore Valuation of Gold Mines. C. Baring Horwood. Calls attention to the essential features of good practice. 3000 w. Bul Am Inst of Min Engrs—Jan., 1909. No. 2426 F.

Sampling Native Copper Deposits. Harley E. Hooper. Brief description of method used by the writer. 600 w. Aust Min Stand—Feb. 3, 1909. No. 3139 B.

Observations on Sampling in the Rand and Rhodesian Mines. H. F. Loftis. Discusses the work of the sampler, and the method of dealing with the occurrence, and systems of valuation. 2800 w. Min Jour—Feb. 20, 1909. No. 2889 A.

See also Prospecting, under MINING.

Mine Signalling.

The Use of Relays in Mining Signalling. An explanation of the Willis system. Diagrams. 1600 w. Prac Engr—July 23, 1909. No. 6840 A.

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The Relation between the Temperatures of Rock and Air (Zusammenhang zwischen Gesteins- und Wittertemperaturen). Ernst Schmid. A theoretical discussion. Ills. Serial, 1st part. 2200 w. Oest Zeitschr f Berg u Hüttenwesen—June 5, 1909. No. 6569 D.

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Development Sampling and Ore Valuation of Gold Mines. C. Baring Horwood and Mungo Park. Calls attention to essential features of good practice in sampling and mine valuation. 3000 w. Min Jour—Sept. 25, 1909. No. 8351 A.

See also Mine Sampling, under MINING.

Mine Waters.

Methods Used in Sealing Off Underground Water. Edmund B. Kirby. Meth-

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A Method of Determining Ground-Water Flow during Shaft Sinking. (Ueber eine Methode zur Ermittlung der zur wältigenden Wasserzuflüsse beim Uebergang vom Schachtabteufen in totem Wasser zur Abteufarbeit auf der Sohle). Dr. Münster. Description and mathematical demonstration. Ills. 2800 w. Glück-auf—Oct. 24, 1908. No. 556 D.

Open Cut.

Glory-Hole Mining at De Lamar, Nevada. W. R. Wardner. Illustrated description of the workings. The material is drawn from an old ore chute, the total cost of extraction being less than 34 cts. a ton. 1200 w. Eng & Min Jour—Feb. 27, 1909. No. 2860.

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Construction and Method of Operation of Ore Bunkers at Skagway. A. L. Bardoe. Brief illustrated description. 600 w. Bul Can Min Inst—Jan., 1909. No. 2045 N.

Mechanical Devices for Filling Ore Bins (Anlagen zur mechanischen Beschickung von Erztaschen). L. Schütt. Describes devices for handling and dumping cars at the Pont-à-Mousson iron works, France. Ills. Serial. 2 parts. 2200 w. Stahl u Eisen—April 7, 1909. No. 4857 each D.

Ore Handling.

Ore Handling at Copper Queen Mine. Maxwell C. Milton. Illustrates and describes the arrangements for handling sticky ore. 2500 w. Mines & Min—Oct., 1909. No. 8257 C.

See also same title, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING.

Panel System.

The Panel System as Applied to Metal Mining. H. E. West. Explains the physical characteristics of the deposit which made this method desirable. Ills. 2000 w. Eng & Min Jour—June 12, 1909. No. 5474.

Patenting.

Patenting Mineral Land. George A. Packard. Details of the process of obtaining a patent to the property of the Osseo Mining Co. 2500 w. Min & Sci Pr—Oct. 16, 1909. No. 8738.

Power Plants.

See Gas Engines, under MECHANICAL ENGINEERING, COMBUSTION MOTORS.

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Problems.

On Some Unsolved Problems in Metal-Mining. Prof. Henry Louis. ("James Forrest" lecture.) Introductory remarks followed by a consideration of prospecting, opening up mineral deposits, exploitation, transportation, dressing of minerals, and workers safety. 15000 w. Inst of Civ Engrs—April 27, 1908. No. 3211 N.

Prospecting.

Prospectors and Prospecting in Nevada. Robert T. Hill. Suggestions for aids in prospecting are given in the present article. 1500 w. Eng & Min Jour—Nov. 28, 1908. Serial. 1st part. No. 705.

A Scientific Search for a New Gold-field. Robert T. Hill. An illustrated account of scientific prospecting which led to the discovery of a new gold district in Nevada. 2500 w. Eng & Min Jour—Dec. 12, 1908. No. 966.

The Hand Drill in Prospecting Placer Deposits. John Power Hutchins. Discusses the advantages and disadvantages as compared with steam-drill prospecting, the methods of drilling, especially with rotation of casing. 4000 w. Eng & Min Jour—Dec. 12, 1908. No. 962.

Churn-Drill Sampling. W. E. Thorne. Brief illustrated discussion of the best practice. 1000 w. Min & Sci Pr—March 6, 1909. No. 3092.

Diamond Drill Prospecting in Southeast Missouri. Otto Ruhl. An account of the setting up of the machines, prospecting methods, etc. Ills. 2200 w. Min Wld—May 1, 1909. No. 4396.

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Pumping.

Pumping Plant at the Tombstone Consolidated. Elton W. Walker. Illustrated description of a plant for pumping a mine where the daily flow averaged over 5,000,000 gallons. 1800 w. Eng & Min Jour—July 24, 1909. No. 6641.

Electrical Mine-Pumps in Europe. A. S. Atkinson. Information in regard to types, efficiency and operation. 2000 w. Min & Sci Pr—Sept. 4, 1909. No. 7693.

The Arrangement of Pumps for Modern Collieries. J. S. Barnes. Illustrates and describes the Hathorn-Davey pumps and the general arrangement of a recent plant. 2800 w. Ir & Coal Trds Rev—Dec. 4, 1908. Serial. 1st part. No. 1026 A.

Water Columns for Deep Level Mines. E. J. Laschinger. Formulates expressions giving the average cost of water columns

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Sinking Pumps. Frank S. Mitchell. Illustrated description of a design. 1000 w. Jour Assn of Engng Socs—March, 1909. No. 4911 C.

The Choice of Mine Pumps (Ueber die Auswahl unterirdischer Wasserhaltungen). P. Hartmann. Discusses the cost and efficiency of electrically and steam driven plunger and centrifugal pumps. Ills. 4500 w. Glückauf—Jan. 30, 1909. No. 2679 D.

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The Pen Lee Stone Quarries. Illustrated description. 1500 w. Quarry—Jan., 1909. No. 1723 A.

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Developments in Quarrying Processes. A. S. Atkinson. Describes modern methods and the application of improved machinery and labor-saving devices. 2500 w. Eng & Min Jour—July 31, 1909. No. 6790.

An Electrically Equipped Stone Quarry. Illustrates and describes a quarry near Gary, Ill., and its equipment. 2500 w. Elec Rev, N Y—Oct. 16, 1909. No. 8780.

An Electrically-Operated Quarry and Plant for Production of Broken Stone at Gary, Ill. Full illustrated detailed description of the plant and its equipment. 7500 w. Eng News—Oct. 21, 1909. No. 8817.

See also Coal Cutting, under COAL AND COKE; and Slate, under MINOR MINERALS.

Recording Apparatus.

Electric Recording Apparatus for Mine Watchmen. Carl L. C. Fichtel. Ill. Illustrates and describes the mechanism and its operation. 1000 w. Eng & Min Jour—Feb. 27, 1909. No. 2861.

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Recording Engineering Records. Lee Hayes. Describes methods used by the Boston and Montana Consolidated Copper and Silver Mining Co., Butte, Montana. 4500 w. Mines & Min—June, 1909. No. 5241 C.

Keeping Engineering Records. E. E. Whiteley. Explains methods used by Calumet and Arizona Mining Co., and Superior and Pittsburg Copper Co., at Bisbee, Ariz. 2500 w. Mines & Min—Oct., 1909. No. 8254 C.

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On the Relation of Safety to Economy in Mining. Malcolm Fergusson. Deals especially with the importance of careful supervision for both efficiency and safety. Discussion. 4000 w. Jour S. African Assn of Engrs—May, 1909. No. 6024 F.

Shaft Lining.

An Account of the Method Employed in Stopping an Extensive Leak, Under High Pressure, in the Tubbing of the East Pit, Murton Colliery, 1907. W. O. Wood. 2000 w. Ir & Coal Trds Rev—Sept. 17, 1909. No. 8138 A.

Shafts.

Concrete-Lined Mine Shafts at Filbert, Pa. Illustrated detailed description of methods used. 1000 w. Eng News—April 8, 1909. No. 3855.

Reclaiming the Inclined Hoistway at Mine 21. Guy C. Stoltz. Describes methods at Mineville, N. Y., and the accident to the hoistway, and methods of reclaiming it. Ills. 1000 w. Eng & Min Jour—March 20, 1909. No. 3264.

Concrete Shafts at Lake Iron Mines. Frederick W. Adgate. Read at meeting of Lake Superior Min. Inst. Describes methods used in sinking in quicksand on the Marquette Range. Ills. 3500 w. Ir Age—Aug. 26, 1909. No. 7341.

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Modern Shaft Sinking. Francis Donaldson. Discusses features of contracts for such work, supplies and machinery needed. 3200 w. Mines & Min—April, 1909. No. 3671 C.

Shaft Sinking by the Freezing Process. Sydney F. Walker. Its use in Germany, England and France, the difficulties met and methods of dealing with them. 6500 w. Mines & Min—Aug., 1909. No. 6887 C.

Method of Refrigeration in the Sinking of Shafts. Samuel K. Patterson. Describes a method used in England in sinking a 490-ft. shaft through quicksand, without the aid of pumps. 1500 w. Min Wld—Dec. 5, 1908. No. 844.

Concrete Linings in Shaft Sinking. R. H. Rowland. Diagrams and description of work in Oklahoma. 1200 w. Eng & Min Jour—Aug. 21, 1909. No. 7184.

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Sinking a Reinforced Concrete Mine Shaft. Albert H. Fay. Illustrated account

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of work at the Morton Mine, Minnesota, where a circular shaft, 21 ft. in diameter, was sunk through 190 ft. of water-bearing strata. 1500 w. Eng & Min Jour—Sept. 15, 1909. No. 8073.

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Sinking in Wet Ground by Injecting Concrete. Jules Lombois. Abstract trans. from *Bul. de la Soc. d. l'Ind Min.* Describes the method. Ills. 2500 w. Eng & Min Jour—March 27, 1909. No. 3534.

Problems of Shaft Sinking in a Michigan Salt Mine. Norman B. Beasley. An interesting account of methods used to overcome great difficulties. A persistent flow of sulphur water, inflow of silt, bad air causing blindness, etc. 1500 w. Min Wld—March 20, 1909. No. 3435.

Sinking a Wet Shaft at Tombstone. Elton W. Walker. An account of sinking through the largest continuous flow of water ever dealt with. Ills. 1200 w. Min & Sci Pr—Feb. 20, 1909. No. 2763.

A Difficult Shaft Sinking Operation at Durwood, Minn. An account of methods used. 1000 w. Ir Trd Rev—Nov. 5, 1908. No. 108.

Shaft Sinking at the Horden Colliery, Southeast Durham. John Joseph Prest. Describes the work incidental to the sinking of three shafts through water-bearing strata. Ills. Discussion. 13500 w. Inst of Civ Engrs—No. 3708. No. 2796 N.

Shaft-Sinking at the Horden Colliery, South-East Durham. John Joseph Prest. Read before the Inst. of Civ. Engrs. Illustrated description of the work. 3000 w. Ir & Coal Trds Rev—April 2, 1909. Serial, 1st part. No. 3914 A.

Sinking Through Sand at Newbiggin Colliery. E. M. Bainbridge and Walter M. Redfearn. Describes the sinking by the drop-shaft method. 3500 w. Ir & Coal Trds Rev—Sept. 17, 1909. No. 8139 A.

Note on a Problem During Shaft Sinking. Charles B. Saner. An account of methods of accomplishing difficult work in the shaft of the Turf Mines, Ltd., on the Rand. 2500 w. Jour Chem, Met & Min Soc of S Africa—Sept., 1908. No. 174 E.

Vertical Shaft Sinking—Buckets v. Skips. Charles B. Saner. Discusses both systems, favoring the latter. General discussion. 4000 w. Jour S African Assn of Engrs—Oct., 1908. No. 1002 F.

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Tubbing for Modern Collieries. J. S. Barnes. Discusses the scientific design of tubbing. Diagrams. 3000 w. Engr, Lond—Oct. 23, 1908. No. 79 A.

Signalling.

Electric Signalling in Mines. Illustrates and describes the Siemens system. 2500 w. Ir & Coal Trds Rev—Aug. 20, 1909. No. 7448 A.

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Automatic Dumping Skip for Vertical Shafts. George C. McFarlane. Illustrates and describes a self-dumping skip for hoisting either rock or water. 2000 w. Eng & Min Jour—June 26, 1909. No. 6009.

Stoping

"Shrinkage" Stopping in Western Australia. F. Percy Rolfe. Describes this method of stoping used at the Lake View Consol Gold Mine, discussing its advantages and disadvantages. Ills. 4000 w. Inst of Min & Met, Bul. 53—Feb. 11, 1909. No. 3160 N.

Subsidence.

The Law of Subsidence. Discusses British law and recent decisions. 1500 w. Col Guard—Nov. 13, 1908. No. 440 A.

Surveying.

A Few Suggestions on How to Survey a Mine. Charles W. Helmick. Briefly considers three methods, explaining the determination of a meridian, etc. 1500 w. Min Wld—Oct. 31, 1908. No. 79.

Need of Instrumental Surveying in Practical Geology. Benjamin Smith Lyman. On the value of instrumental surveying and mapping. 3000 w. Bul Am Inst of Min Engrs—Aug., 1909. No. 7123 F.

Colliery Surveys. D. Harrington. Describes the methods of surveying and mapping surface work used in the rocky mountain region. 5000 w. Mines & Min—Sept., 1909. Serial. 1st part. No. 7492 C.

Stope Measurements. Otto S. Tonnensen. States some of the objections to methods employed, and describes an improved method. Ills. 8000 w. Jour Chem, Met & Min Soc of S. Africa—May, 1909. No. 6671 E.

Survey to Fix Position of the Water Haigh Pits. G. R. Thompson. Read at Yorkshire meeting of the Nat. Assn. of Col. Mgrs. Describes the methods of conducting the survey. Ills. Discussion. 4500 w. Ir & Coal Trds Rev—July 2, 1909. No. 6311 A.

MINING AND METALLURGY

Surveying

A Note on Running Levels Underground (Ein Beitrag zur Ausführung von Nivellements in der Grube). Viktor Kadainka. Illustrates and describes a new device for approximate work. Serial. 1st part. 1500 w. Oest Zeitschr f Berg u Hüttenwesen—Nov. 7, 1908. No. 1148 D.

Levelling Results and Their Treatment (Nivellementaufgaben und ihre Behandlung). Viktor Kadainka. A discussion of levelling with special reference to mine surveying, the reduction and plotting of notes, etc. Ills. Serial. 1st part. 1800 w. Oest Zeitschr f Berg u Hüttenwesen—Feb. 13, 1909. No. 3367 D.

Timber Drawing.

Timber Drawing at the Julius III Mine, Brück (Ueber das Stempelrauben mittels Raubwinde im Kammerbruchbau des k.k. Schachtes Julius III zu Brück). Gustav Ryba. Illustrates and describes a machine for drawing timber from worked-out rooms. Serial. 1st part. 2200 w. Oest Zeitschr f Berg u Hüttenwesen—Nov. 28, 1908. No. 1150 D.

Timbering.

An Improved Method of Timbering Workings. Martin Schwerin. Diagrams and description of a method involving stoping by successive inclined sluices and filling in the spaces as the work progresses. 1200 w. Min Wld—Feb. 6, 1909. No. 2325.

Some German Mine Props. Illustrates and describes mechanical props, generally made of metal. 1000 w. Eng & Min Jour—Aug. 28, 1909. No. 7392.

The Application of Steel to Mine Timbering. R. B. Woodworth. Abstract of paper read before the Am. Min. Cong. Reviews the use of steel in mines, describing the forms used, and the advantages as compared with wood. Ills. 5000 w. Min Wld—Oct. 2, 1909. No. 8312.

Concrete in Mine Support. W. R. Crane. Describes uses made of concrete in mines, its substitution for timber, etc., giving a bibliography. Ills. 3500 w. Min & Sci Pr—Feb. 27, 1909. No. 2949.

Strength of Timber vs. Reinforced Concrete. Ernest McCullough. A comparison, with discussion of the proper mixing of the concrete. 2500 w. Min Wld—March 6, 1909. No. 3018.

The Use of Concrete for Mine Supports. W. R. Crane. Paper read before the Institution of mining engineers. Discusses its profitable use in mining, costs, methods, etc. Ills. 6000 w. Ir & Coal Frds Rev—May 28, 1909. No. 5454 A.

MINING

Tunneling

Applications of Concrete in the Metal Mining Industry. Henry W. Edwards. Describes recent uses of reinforced-concrete underground and in surface plant and equipment. 3000 w. Engineering Magazine—Nov., 1909. No. 8830 B.

Reinforced Concrete Shaft Linings (Die Bedeutung des Eisenbetons für den Schachtausbau). Dr. Färber. Mathematical discussion of their strength and design with notes on their cost. Ills. 1700 w. Glückauf—March 13, 1909. No. 4263 D.

Some Recent Applications of Concrete in Mining (Einige neuere Betonierungsverfahren und ihre Anwendungsgebiete im Bergbau). R. Scharf. Describes several applications in tunnel and shaft lining. Ills. 1800 w. Glückauf—March 27, 1909. No. 4265 D.

Timbering Crushing Seams (Strecken-sicherung und Entspannungsverheib in druckhaften Flözen). Dr. Niess. Describes timbering methods for galleries in bad ground. Ills. Serial, 1st part. 3100 w. Glückauf—July 3, 1909. No. 7271 D.

See also Mining, under COAL AND COKE.

Timber Preservation.

See same title, under CIVIL ENGINEERING, CONSTRUCTION.

Tonnage Computation.

Computing Tonnage from Volume of Ore Removed. S. L. Lefevre and Guy C. Stoltz. Explains method followed to determine the tonnage of ore extracted in any trespass, where two companies work together harmoniously. Plan. 800 w. Eng & Min Jour—Feb. 13, 1909. No. 2465.

Transportation.

Mule-Back Transportation of Sectionalized Machinery. F. C. Roberts and Walter W. Bradley. Illustrated description of methods used in transporting machinery to districts accessible only by mule-back. 4000 w. Min & Sci Pr—May 29, 1909. No. 5206.

Freighting Ore with Big String Teams. George C. McFarlane. An account of practice in California and its cost. 1500 w. Eng & Min Jour—May 29, 1909. No. 5159.

Tributing.

Tributing. H. F. Lofts. A discussion of this system of mining. 2500 w. Min Jour—June 5, 1909. No. 5524 A.

Tunneling.

See Tunneling Machines, under CIVIL ENGINEERING, CONSTRUCTION.

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Tunnel Lining

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Classifiers

Tunnel Lining.

See same title, under CIVIL ENGINEERING, CONSTRUCTION.

Unwatering.

New Unwatering Plant at the Rosenblumendelle Colliery (Die neue Wasserhaltungsanlage der Zeche Rosenblumendelle). Herr Eichler. Describes the arrangement of sumps and the electric numping plant. Ills. 2000 w. Glückauf—July 17, 1909. No. 7274 D.

Valuation.

The Computation of the Present Value of Developed and Undeveloped Mines. W. H. Goodchild. Paper before the Inst. of Min. & Met. Deals mainly with the computation of the present gross value. 3800 w. Ir & Coal Trds Rev—April 23, 1909. No. 4473 A.

The Valuation of Mining Areas on the Rand. W. Fischer Wilkinson. Considers the factors that decide the size of a mine and the principles of valuation. 2800 w. Inst of Min & Met., Bul. 55—April 15, 1909. No. 4736 N.

Ventilation.

Pressure Fans vs. Exhaust Fans. Audley H. Stow. Their application to colliery ventilation, giving arguments for and against each form of ventilation, considering their weight and bearing. 4500 w.

Bul Am Inst of Min Engrs—Feb., 1909. No. 2750 C.

Problems of Mine Ventilation: Gas Caps of Inflammable Gas. Abstract of the lecture of W. H. Hepplewhite at Nottingham University. 5500 w. Ir & Coal Trds Rev—Feb. 12, 1909. No. 2599 A.

See also Mine Ventilation, under COAL AND COKE.

Welfare Work.

Welfare Work in Iron Mining. W. H. Moulton. Read before L. Superior Min. Inst. Explains the methods of the Cleveland-Cliffs, Colorado Fuel & Iron, and other companies. 5000-w. Ir Age—Oct. 14, 1909. No. 8546.

Wire Ropes.

Cross-Laid Double-Layer Wire Ropes. An account of experiments recently made with such ropes, and some serious objections to their use. 800 w. Engr, Lond—Jan. 15, 1909. No. 2082 A.

The Testing of Wire Rope (Prüfung der Drahtseile). Hermann Kroen. A mathematical discussion of its strength with tables of data. Ills. 3200 w. Oest Zeitschr f Berg u Hüttenwesen—May 29, 1909. No. 5755 D.

See also same title, under MECHANICAL ENGINEERING, MATERIALS OF CONSTRUCTION.

ORE DRESSING AND CONCENTRATION

Briquetting.

The Briquetting of Iron Ores by the Method of the "Deutsches Brikettierungs-Gesellschaft" (Eisenerzbrikettierung nach dem Verfahren der "Deutschen Brikettierungs-Gesellschaft," Altenkirchen). R. Goebel. Describes the method and gives costs of plant and operation. 2800 w. Stahl u Eisen—Feb. 17, 1909. No. 3361 D.

The Purple Ore Briquetting Plant of the Helsingborg Kepparwerks Aktiebolag. Prof. G. Franke. Abstract trans, from *Glückauf*. Illustrates and describes this part of a large copper works in Sweden. 2500 w. Ir & Coal Trds Rev—April 2, 1909. No. 3916 A.

Calculations.

Calculations in Ore Concentration. Full abstract of a paper by Dr. Rudolf Gahl, before the Colo. Sec. of W. Assn. of Tech. Chem. & Met. Discusses simple mathematical calculations as a means of getting

practical information from screen tests and assays. 3500 w. Elec-Chem & Met Ind—July, 1909. No. 6192 C.

Classification.

Classification at El Tiro Mill, Pima County, Arizona. George W. Brown. Gives a report of working results with the Richards pulsator classifier. 1200 w. Mines & Min—Jan., 1909. No. 1410 C.

Classification of Ores at the Butte Reduction Works. A. H. Wethey. Describes the use of the Pratt centrifugal screen for sizing without regard to specific gravity. 1500 w. Mines & Min—Jan., 1909. No. 1413 C.

Free and Hindered Settling of Mineral Grains. Arthur O. Christensen. Discusses the theory and principles as applied to ore classification. Ills. 4800 w. Eng & Min Jour—Sept. 11, 1909. No. 7681.

Classifiers.

The Richards Pulsator Jig and Pulsator Classifier. Frank E. Shepard. Read be-

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Copper

fore the Colo. Sci. Soc. Illustrated detailed description. 2200 w. Min Wld—Jan. 9, 1909. No. 1652.

Copper.

The Boston Consolidated Mill at Garfield, Utah. Leroy A. Palmer. Illustrates and describes the large mill built to treat sulphides with gold and silver values amounting to only 20 cts. per ton. The property can produce 50,000,000 lb. of copper annually with the estimated tonnage and values. 3500 w. Min Wld—Jan. 12, 1909. No. 1443.

The Ohio Concentrator. Leroy A. Palmer. A description of the mill at Bingham, Utah, which will have a capacity of 2250 tons per day. 2500 w. Mines & Min—June, 1909. No. 5245 C.

Crushers.

The New Cochran Crusher. J. T. Barkeley. Describes a crusher having a new movement combining crushing and torsional effect. 1200 w. Eng & Min Jour—Aug. 7, 1909. No. 6945.

See also same title, under MECHANICAL ENGINEERING, MACHINE ELEMENTS AND DESIGN.

Crushing.

Practical Notes on Dry Crushing Mills. M. W. von Bernewitz. Gives practical experience with sulpho-telluride ore at Kalgoorlie, W. Aust. 3500 w. Min Jour—Sept. 4, 1909. No. 7742 A.

See also Gold Milling, under ORE DRESSING AND CONCENTRATION.

Drying.

Dryers and Drying. W. B. Ruggles. Discusses artificial methods for the removal of moisture. 1200 w. Cassier's Mag—April, 1909. No. 3637 B.

The Technique of Desiccation. O. Bechstein, in *Prometheus*. Illustrates and describes apparatus for the artificial drying of agricultural products and wastes. 2500 w. Sci Am Sup—May 22, 1909. No. 4906.

Calculations for Dryer Design. William M. Grosvenor. Presented at meeting of Am. Inst. of Chem. Engrs. With humidity chart supplement, and tables. 4000 w. Heat & Vent Mag—May, 1909. No. 4929.

Elmore Process.

Elmore Vacuum Process at Broken Hill, New South Wales. Stanley Elmore. Illustrated description of the installation of the Zinc Corporation, Ltd. 2000 w. Min Jour—Feb. 20, 1909. No. 2888 A.

Elmore Process as Applied by Zinc Corporation. Illustrated description of works

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Gold Milling

in New South Wales, and of methods of treatment. 1500 w. Eng & Min Jour—July 31, 1909. No. 6789.

Evaporators.

Vacuum Slime-Filters at Goldfield. Alscribes the vacuum apparatus, presenting its advantages. 1400 w. Elec Chem & Met Ind—May, 1909. No. 4509 C.

Filtration.

The Evaporator. Edward Zarembo. Describes the evolution of filter work at Goldfield. 1000 w. Min & Sci Pr—July 10, 1909. No. 6320.

Flotation Process.

Ore Dressing by Adhesion of Liquid Films. R. Stören. Reviews the principles of the Elmore process and other systems based upon similar principles. 4000 w. Eng & Min Jour—Oct. 31, 1908. No. 14.

Gold Milling.

How to Clean and Dress Amalgamating Plates. Justin H. Haynes. Useful hints and suggestions. 1500 w. Min Wld—Nov. 21, 1908. No. 462.

Grading Assays and Grinding Efficiencies. Arthur Yates. Discusses the value of grading analyses in connection with estimating crushing efficiency, and also as a method of checking extraction results. 2000 w. Jour Chem, Met & Min Soc of S. Africa—Dec., 1908. No. 2707 E.

Salt Water in Stamp-Mills. T. A. Rickard. Describes the effect of salt water, and the method of clearing the tables in the Alaska-Treadwell mill. Ills. 1500 w. Min & Sci Pr—June 19, 1909. No. 5827.

New Type of Washer for Low-Grade Gold Ores. Joseph Hyde Pratt. Illustrated description of a machine found superior to other types for treating the gold ores of the South Atlantic States. 2000 w. Eng & Min Jour—May 8, 1909. No. 4564.

Ore Washing at Cripple Creek. Describes the ore deposits, methods of screening and washing. 2000 w. Min & Sci Pr—Feb. 20, 1909. No. 2766.

Milling in the Cripple Creek District, Colorado. S. A. Worcester. Discusses causes of failure in past milling operations, offering suggestions for successful plants. 2500 w. Eng & Min Jour—May 8, 1909. No. 4569.

Milling Conditions in the Goldfield District, Nev. A. H. Martin. Describes the complex ores, and the problems of their treatment. Illustrated description of the 100-stamp mill and its operation. 3000 w. Min Wld—March 13, 1909. No. 3123.

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Gold Milling

Milling at Grass Valley and Nevada City. G. E. Wolcott. Employs amalgamation, concentration, and cyanide treatment. Concentrates are not treated at the mill. Ills. 2000 w. Eng & Min Jour—Feb. 27, 1909. No. 2858.

The 100-Stamp Desert Mill at Millers, Nevada. Al. H. Martin. Illustrated description of the mill for treating Tonopah ores. 1500 w. Min Wld—April 24, 1909. No. 4178.

Boston-Sunshine Mill. G. W. Wood. Describes a reconstructed plant and the processes used in treating the gold ores. 1200 w. Min & Sci Pr—Aug. 28, 1909. No. 7512.

The Treatment of the Gold Ores of Hog Mountain, Alabama. T. H. Aldrich, Jr. An account of experiments made, and conclusions reached, concerning the treatment of certain refractory low-grade gold-ores. 2500 w. Bul Am Inst of Min Engrs—Nov., 1908. No. 682 C.

Metallurgical Treatment of Mount Morgan Ores. J. Bowie Wilson. Describes processes for gold recovery developed to suit the peculiarities of the ores. Ills. 800 w. Eng & Min Jour—April 24, 1909. No. 4175.

The St. George Treatment Plant (W. A.). Percy Ifould. A brief description of a modern plant. 1200 w. Aust Min Stand—Sept. 30, 1908. No. 178 B.

Treatment of Sulphide Ores in Victoria. S. Radcliff and J. Drevermann. Abstract from Pro. of Aust. Inst. of Min. Engrs. Describes experiments made to determine the associated minerals, gain information as to the cause of volatilization loss, and to find out whether satisfactory extraction could be made without roasting. 1500 w. Min & Sci Pr—Sept. 11, 1909. No. 7833.

Description of Ore Treatment at the Giant Mine, Hartley District, Rhodesia. Reginald C. H. Cooke. Describes the process of extraction used for a heavily mineralized chloride schist, intermixed with ironstone and quartz. 2500 w. Jour Chem, Met, & Min Soc of S Africa—Nov., 1908. No. 1802 E.

Visit to Simmer Deep, Ltd. Illustrated description of reduction works for the treatment of gold ores of South Africa. 3000 w. Jour Chem, Met & Min Soc of S Africa—May, 1909. No. 6674 E.

Simmer Deep and Jupiter Reduction Works. J. E. Thomas. Illustrated description of joint works in South Africa, and the processes followed. 3000 w. Min & Sci Pr—Sept. 18, 1909. No. 8035.

See also Amalgamation, Australia, Colorado, Cyaniding, Nevada, and Rhodesia,

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under GOLD AND SILVER; and Foundations, under CIVIL ENGINEERING, CONSTRUCTION.

Graphite.

Graphite Concentration. H. P. H. Brummell. A résumé of work done in Canada, with brief illustrated descriptions of various plants. 4000 w. Can Min Jour—May 1, 1909. No. 4490.

Concentration of Flake Graphite. Frederick D. Chester. Discusses the concentration of the ore, and the conditions that determine profitable production. 1000 w. Eng & Min Jour—Oct. 23, 1909. No. 8729.

Grinding.

The Computation of Crushing Efficiency of Fine Grinding Machines. H. Stadler. A study, giving tables and calculations, and emphasizing the importance of care in making grading analyses. 3000 w. Jour S African Assn of Engrs—Dec., 1908. No. 2047 F.

Iron.

Hand Sorting and Mechanical Dressing of the Dillenburg Red Ironstone (Ueber Handscheidung und mechanische Aufbereitung des Roteisensteins im Dillenburgischen). Herr Eickhoff. The ores are concentrated by classifying and jigging. Ills. 2500 w. Stahl u Eisen—Jan. 20, 1909. No. 2663 D.

Iron Ores.

See Magnetic Concentration, under ORE DRESSING AND CONCENTRATION.

Jigs.

Richards Pulsator Jig and Classifier. Frank E. Shepard. Describes two devices for the concentration and classification of ores. 3500 w. Eng & Min Jour—March 13, 1909. No. 3118.

See also Washing, under COAL AND COKE; and Classifiers, under ORE DRESSING AND CONCENTRATION.

Launders.

The Carrying Capacity of Launderers. W. C. Browning. Gives results of experiments at the Utah State School of Mines, with launders of glass, wood and linoleum at different grades. 1700 w. Mines & Min—Feb., 1909. No. 2230 C.

Lead Milling.

Milling Practice in South-east Missouri District. Otto Ruhl. Illustrated description of the practice in the disseminated lead district, and its development. 2500 w. Min Wld—June 19, 1909. No. 5671.

Lead Milling

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Lead Milling

Metallurgical Treatment of Jamesonite Ores. G. P. Ives and I. D. Ossa. Abstract of a thesis submitted to the faculty of the S. D. State Sch. of Mines. Describes these ores of value for the metals lead and antimony, also gold and silver, and their treatment. 1200 w. Eng & Min Jour—May 1, 1909. No. 4383.

The Daly-West Concentrating Plants, Utah. Leroy A. Palmer. Illustrated description of a mill said to be a model lead-silver concentrator. 2200 w. Min Wld—Oct. 9, 1909. No. 8458.

Milling Costs. R. S. Handy. Suggestions for arriving at milling costs and efficiency, with daily report blank. 1000 w. Min & Sci Pr—Jan. 23, 1909. No. 2130.

Metallurgy of Broken Hill, New South Wales. Gerard W. Williams. Describes concentration methods. 6000 w. Eng & Min Jour—Nov. 7, 1908. No. 146.

Treatment of Broken Hill Ores. W. Poole. Read before the Sydney Univ. Engng. Soc. Detailed description of the concentration of these complex lead-zinc ores. 6800 w. Queens Gov Min Jour—Jan. 15, 1909. Serial, 1st part. No. 2504 B.

The Concentration of Silver-Lead Ores, Broken Hill. U. F. Stanley Low. Gives details of methods adopted at Block 10 Co.'s works. Ills. 5500 w. Aust Min Stand—March 31, 1909. Serial. 1st part. No. 4615 B.

The Concentration of Silver-Lead Ores at the Works of Block 10 Co., Broken Hill, N. S. W., Australia. V. F. Stanley Low. Gives an outline of the system employed and details of operation. Ills. 4000 w. Bul Am Inst of Min Engrs—Sept., 1909. No. 8192 F.

See also France and Oklahoma, under LEAD AND ZINC.

Magnetic Concentration.

The Concentration of Low-Grade Magnetic Iron Ores. G. C. MacKenzie. Considers important features of the problem. 3500 w. Ir Trd Rev—May 6, 1909. No. 4535.

Magnetic Concentration of Iron Ores, Ontario. George C. Mackenzie. Abstract from report of Bureau of Mines, Toronto. A discussion of the concentration problem and proposed methods. 2500 w. Min Wld—May 8, 1909. No. 4582.

The Grondal Method of Concentrating Ore. N. U. Hansell. A description of the wet magnetic methods and apparatus employed in Sweden and other European

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countries. Ills. 2200 w. Ir Trd Rev—Feb. 11, 1909. Serial, 1st part. No. 2440.

The Magnetic Separation of Ores and Its Application to Spathic Iron (Siderite) in Siegerland. W. J. Bartsch. Abstract of a paper read at meeting of the Assn. "Berggeist" at Siegen. Explains the principles of separation, illustrating and describing the Brüderbund mines plant. 3000 w. Ir & Coal Trds Rev—May 7, 1909. No. 4732 A.

Notes on Some Recent Swedish Plants and Methods for Concentrating and Briquetting Iron Ores (Mitteilungen über einige neuere schwedische Anlagen und Verfahren für Aufbereitung und Briquetierung von Eisenerzen und Kiesabbränden). G. Franke. Illustrated description of latest developments in the Grondal process. Serial, 1st part. 4800 w. Glückauf—Oct. 3, 1908. No. 552 D.

See also Tungsten, under ORE DRESSING AND CONCENTRATION.

Magnetic Separation.

See Magnetic Separators, under MECHANICAL ENGINEERING, MACHINE WORKS AND FOUNDRIES; and Monazite, under MINOR MINERALS.

Mill Management.

See Management, under MINING.

Mill Tests.

See Assaying, under GOLD AND SILVER.

Mixed Sulphides.

The I. R. Process in Cornwall. Describes this process, its advantages, and the results obtained with complex sulphides. 1400 w. Min Jour—July 17, 1909. No. 6662 A.

The Concentration and Separation of Mixed Sulphides at Rosas, Sardinia (Die Aufbereitung von Mischserzen in Rosas, Insel Sardinien). Umberto Cappa. Describes the process and gives a flow sheet of the mill. Ills. 2000 w. Serial. 2 parts. Oest Zeitschr f Berg u Hüttenwesen—Sept. 18 and 25, 1909. No. 8661 each D.

Ore Dressing.

Ore Dressing in the United States and Mexico. H. A. Guess. Abstract of a paper read before the Colo. Sci. Soc. An outline of the principal processes other than smelting. 6000 w. Min Wld—Oct. 16, 1909. No. 8712.

Pneumatic Concentration.

See Salt, under MINOR MINERALS.

Roasting.

Some Developments of Blast Roasting. H. O. Hofman. Describes the up-draft

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Sampling

and downdraft roasting apparatus used for these processes. 2200 w. *Min Jour*—June 12, 1909. No. 5631 A.

See also Calcium Sulphate, under MISCELLANY.

Sampling.

Modern Practice of Ore-Sampling. David W. Brunton. Reviews methods of sampling used in the past and present, illustrating and describing types of time-samplers and other sampling machines. 5500 w. *Bul Am Inst of Min Engrs*—Aug., 1909. No. 7124 F.

Principles of Machine Sampling. John A. Church. Discusses the controlling elements and the possible methods of remedying their faults. 2500 w. *Eng & Min Jour*—Nov. 14, 1908. No. 258.

Methods of Sampling Iron Ore. J. M. Camp. Explains the systems of commercial sampling adopted by the U. S. Steel Corporation. 2200 w. *Ir Trd Rev*—Jan. 28, 1909. No. 2131.

The Methods of the United States Steel Corporation for the Commercial Sampling and Analysis of Iron Ores. J. M. Camp. Explains methods. 10000 w. *Elec Chem & Met Ind*—Feb., 1909. No. 2194 C.

Sampling of Cobalt Ores. Albert R. Ledoux. Describes the methods of sampling and ore treatment. 2000 w. *Can Min Jour*—July 1, 1909. No. 6115.

The Projected Custom Sampling Plant—To Be Erected This Year in Cobalt, Ont. Explains the province of the sampling company, and shows the layout and process of the proposed works. 1500 w. *Can Min Jour*—Oct. 1, 1909. No. 8372.

Screening.

See same title, under COAL AND COKE.

Silver Milling.

All-Sliming. E. M. Hamilton. Discusses the advisability of all-sliming in the cyanidation of silver ores, describing an appliance for collecting clean charges of extremely fine sand. 2000 w. *Min & Sci Pr*—Aug. 21, 1909. No. 7372.

Mines and Plants of the Pittsburg Silver Peak. Henry Hanson. An illustrated discussion of the milling practice at these mines in Nevada. Ills. 3500 w. *Min & Sci Pr*—May 8, 1909. No. 4652.

Pittsburg Silver Peak Mill. Henry Hanson. Illustrated description of the surface plant and processes in use at the mill at Blair, Nevada. 4500 w. *Mines & Min*—July, 1909. No. 6186 C.

Metallurgical Practice at Hacienda de la Union. Francisco Narvaez. Illus-

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Stamp Mills

trated description of the present system of treatment at Pachuca, Mexico. 3000 w. *Eng & Min Jour*—Nov. 21, 1908. No. 406.

Treating Low-Grade Refractory Ores of Mexico. Mark R. Lamb. An account of present practice and the need of cheapening costs. Ills. 3500 w. *Min Wld*—July 3, 1909. No. 6135.

See also Cyaniding, and Mexico, under GOLD AND SILVER.

Sizing.

Close Sizing of Dry Finely Crushed Ores. E. Goodwin Steele. Discusses the construction and advantages of the vibromotor sizer for dry ores, and gives results of tests. Ills. 2500 w. *Eng & Min Jour*—March 6, 1909. No. 2979.

Slimes Treatment.

Theory of the Settlement of Slime. Harrison Everett Ashley. Supplementary to a paper by H. S. Nichols, published July 11, 1908, in this same paper. 1000 w. *Min & Sci Pr*—June 12, 1909. No. 559a.

Method for Saving Slimes in Ore Concentration. James N. Flood. Illustrates and describes a method and apparatus for saving slimes and float metal in concentrating processes where a flow of dressing water is employed. 2000 w. *Min Wld*—May 29, 1909. No. 5170.

A Proposed New System for the Cyanide Treatment of Slimes. Ferdinand McCann. An explanation of the dilution system of slime treatment. 2500 w. *Eng & Min Jour*—Oct. 2, 1909. No. 8277.

See also Vanners, under ORE DRESSING AND CONCENTRATION; and Cyaniding, under GOLD AND SILVER.

Stamp Mills.

Practical Working of the Stamp Mill. Algernon Del Mar. Discusses important details of construction and related matters. 2000 w. *Eng & Min Jour*—Sept. 18, 1909. No. 7823.

Some Notes on the Construction and Operation of the Gravity Mill. G. H. Fison. Detailed discussion. 2500 w. *Min Jour*—Sept. 4, 1909. No. 7741 A.

The Development of Heavy Gravitation Stamps. W. A. Caldecott. An illustrated discussion of the development and of some of the factors affecting present-day stamp-milling, showing the advantages of heavy stamps. 4000 w. *Inst of Min & Met, Bul.* No. 59—Aug. 12, 1909. No. 7784 N.

Some Notes on the Gravitation Stamp Mill. R. C. Robinson. Describes the general design and construction and some details. 4000 w. *Queens Gov Min Jour*—Oct. 15, 1908. No. 460 B.

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Stamp Mills

The Proper Design of Cams. Mark R. Lamb. Considers the important features of stamp-mill cam design, the strains, and related matters. 1500 w. Eng & Min Jour—July 10, 1909. No. 6248.

The Mechanics of Stamp Mills (zur Mechanik der Pochwerke). M. Herrmann. Mathematical discussion. Ills. Serial, 1st part. 2000 w. Oest Zeitschr f Berg u Hüttenwesen—May 1, 1909. No. 5752 D.

Graphical Determination of the Form of Stamp Cams (Zeichnerische Ermittlung der Gestalt von Aufwerfdaumen). M. Herrmann. Illustrated description of method. 1500 w. Zeitschr d Oest Ing u Arch Ver—March 26, 1909. No. 4281 D.

Tailings.

Impounding Mill Tailing. H. W. MacFarren. Suggestions for carrying out the purposes in view. Ills. 700 w. Min & Sci Pr—Sept. 4, 1909. No. 7692.

Tailings Disposal.

Tailings Disposal Plant at the Wolverine Mill. C. Kemble Baldwin. Illustrated description of plant at Gay, Michigan, for disposal of copper tailings. 2000 w. Eng & Min Jour—July 10, 1909. No. 6250.

Tin.

Notes on Tin Dressing. H. W. Hutchinson. An account of a series of tests whose object was to determine the losses in connection with tin dressing. Ills. 4500 w. Inst of Min & Met, Bul. No. 50—Nov. 12, 1908. No. 892 N.

Tube Mills.

Tube-Mill Liners. F. C. Brown. Describes the "ribbed liner" which has given satisfaction at the Komata Reefs and Waihi Grand Junction mines, Diagrams. 1500 w. N Z Mines Rec—April 16, 1909. No. 5822 B.

Tungsten.

The Separation of Tungsten Minerals.

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Algeria

Henry E. Wood. Abstract of paper read before the Colo. Sci. Soc. Considers wet concentration and magnetic separation, favoring the latter where it is possible to use it. 1500 w. Min Wld—May 22, 1909. No. 4935.

Vanners.

The Treatment of Slime on Vanners. Rodolf Gahl. A report of tests made by the Detroit Copper Mining Co. to determine whether it would pay to retreat slime-tailings. 5500 w. Bul Am Inst of Min Engrs—Sept., 1909. No. 8193 F.

Wilfley Tables.

Experimental Work in Ore Concentration. John Allen Davis. Reports investigations made to determine the conditions of greatest efficiency in concentrating a classified product on tables. 1800 w. Eng & Min Jour—Nov. 7, 1908. No. 148.

Zinc Milling.

Improvements at the Oronogo Circle Mill No. 5. Otta Ruhl. Illustrates and describes equipment for setting and treating fine material. 1800 w. Eng & Min Jour—Nov. 21, 1908. No. 407.

Mechanical Preparation of Ores in Sardinia (Die mechanische Aufbereitung der Erze in Sardinien). E. Ferraris. Brief description of the apparatus and methods used. Ills. 3500 w. Oest Zeitschr f Berg u Hüttenwesen—June 26, 1909. No. 6571 D.

The New Blende Concentrating Works at the "Neue Helene" Zinc-Lead Mine at Scharley, Upper Silesia (Die neue Blende-aufbereitungsanlage des Zink-und Bleierzbergwerks "Neue Helene" bei Scharley, Oberschlesien). Herr Piegza. Detailed description of the equipment of this large mill. Ills. 3000 w. Glückauf—June 5, 1909. No. 6573 D.

See also Lead Milling, under ORE DRESSING AND CONCENTRATION.

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Alaska.

Progress in Alaska. Alfred H. Brooks. Reviews the production for 1908, and discusses some of the causes that are retarding the mineral industry. 1500 w. Min & Sci Pr—Jan. 30, 1909. No. 2292.

Alaska and Its Mineral Resources. Alfred H. Brooks. Information concerning the mineral resources and their development, transportation, etc. 4000 w. Pro

Am Min Cong—1908. No. 4143 N.

Transportation Facilities in Alaska and the Yukon. W. M. Brewer. Information relating to means of transportation, distances, routes, ports, etc. Maps. 2000 w. Min & Sci Pr—April 3, 1909. No. 3827.

Algeria.

The Mining Industry in Algeria and Tunisia. M. Clère. An account of the mining of iron, lead, zinc, and phosphates,

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Alloys

and matters affecting the industry. 3500 w. Eng & Min Jour—Sept. 4, 1909. No. 7567.

Alloys.

The Alloys of Nickel (*Les Alliages de Nickel*). A. Portevin. Summary of Prof. Tammann's researches on alloys of nickel with bismuth, cadmium, cobalt, chromium, antimony, silicon, tin, lead, thallium and zinc. Ills. 4000 w. Rev. de Métal—Nov., 1908. No. 1108 E + F.

The Alloys of Lead (*Les Alliages de Plomb*). A. Portevin. Summarizes the results of Prof. Tammann's researches on alloys of lead with calcium, cobalt, chromium, indium, potassium, sodium, palladium, platinum, antimony, thallium, etc. Ills. 3500 w. Rev de Métal—Dec., 1908. No. 1911 E + F.

The Alloys of Manganese (*Les Alliages de Manganèse*). A. Portevin. Summarizes the results of Prof. Tammann's researches on the alloys of manganese with nickel, lead, phosphorus, antimony, silicon, and tin. Also alloys of magnesium with bismuth, cadmium, potassium, sodium, nickel, lead, antimony, tin, thallium, and zinc. Ills. 500 w. Rev de Métal—Oct., 1908. No. 516 E + F.

The Silicon-Magnesium Series (*Sur le Système Silicum-Magnésium*). P. Lebeau and P. Bossuet. A metallographic study of the alloys of these two metals. Ills. 1800 w. Rev de Métal—March, 1909. No. 4212 E + F.

The Preparation and Properties of Silico-Manganese and Commercial Silico-Spiegel (*Préparation et Propriétés des Silico-manganèses et Silico-Spiegels industriels*). Jean Escard. Describes the preparation of these alloys in the electric furnace. 3200 w. L'Elec—May 8, 1909. No. 5729 D.

The Alloys of Antimony (*Les Alliages d'Antimoine*). M. A. Portevin. Summarizes the results of Prof. Tammann's researches on the alloys of antimony with bismuth, calcium, cadmium, cobalt, chromium, iron, etc. Ills. 6000 w. Rev de Métal—Feb., 1909. No. 3308 E + F.

Metallographic Researches at the Göttingen Institute of Mineral Chemistry (*Recherches métallographiques effectuées à l'Institut de Chimie minérale de Göttingen*). G. Tammann. A brief review of the results of researches on the constitution of alloys. Ills. 4500 w. Rev Gen des Sciences—May 15, 1909. No. 5728 D.

The Industrial Alloys of Chromium (*Les Alliages industriels de Chrome*). Jean Escard. Brief notes on the alloys

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Atomic Weights

of chromium with silicon, aluminium, nickel, tin, manganese, copper, tungsten and vanadium. Ills. 5600 w. Rev Gen des Sci—Aug. 15, 1909. No. 7922 D.

The Alloys of Silicon, Tin and Zinc (*Les Alliages de Silicium*). M. A. Portevin. Summarizes the results of Prof. Tammann's researches on alloys of silicon with aluminium, bismuth, calcium, cobalt, magnesium, lead, tin and thallium; of tin with calcium, cobalt, chromium, potassium, sodium and platinum; and of zinc with various metals. Ills. 8000 w. Rev de Métal—Sept., 1909. No. 8607 E + F.

America.

The Mineral Wealth of America. R. W. Raymond and W. R. Ingalls. A general survey of the known mineral deposits, their development, and their influence on civilization. 5500 w. Bul Am Inst of Min Engrs—March, 1909. No. 3469 F.

Applied Chemistry.

The International Chemical Congress. John B. C. Kershaw. A short resumé of papers of special interest. 3000 w. Cassier's Mag—Oct., 1909. No. 8467 B.

The International Congress of Applied Chemistry. A report of the 7th Congress recently held in London, with abstracts of papers. 7000 w. Engng—June 4, 1909. Serial. 1st part. No. 5529 A.

Arizona.

Mining and Mineral Resources of Arizona. Frank Cox. 1500 w. Pro Am Min Cong—1908. No. 4127 N.

Arkansas.

Mineral Resources of Arkansas. A. W. Estes. Brief account of deposits of zinc, lead, coal, beauxite, marble, granite, and other minerals of value. 2000 w. Pro Am Min Cong—1908. No. 4129 N.

Atomic Theory.

Suggestions for a New Atomic Theory. James Moir. An explanation of the writer's theory which is based upon the carbon atom. Diagrams and discussion. 5500 w. Jour Chem, Met & Min Soc of S Africa—April, 1909. No. 5527 E.

Atomic Weights.

An Outline of a New Practical Method for the Calculation of Atomic Weights. Dr. Gustavus D. Hinrichs. Claims that the official atomic weights of the Am. Chem. Soc. are not true to nature, and outlines the author's theory. Also editorial. 4000 w. Elec-Chem & Met Ind—July, 1909. No. 6194 C.

MINING AND METALLURGY

Australia

Australia.

Mines and Mining Plant in Australia. A statement of the localities of the chief metals and a short review of their development. 4500 w. *Min Jour*—Feb. 20, 1909. No. 2887 A.

Distribution of Minerals on the Pacific Littoral. Abstract of a lecture by Dr. Logan Jack, before the Australasian Assn. for the Adv. of Science. Discusses the geographical distribution of minerals and its influence on commerce. 2500 w. *Aust Min Stand*—Feb. 10, 1909. No. 3142 B.

The Queensland Mining Industry. . review of the year 1908. Report of A. R. Macdonald, Under Secretary for Mines. 24500 w. *Queens Gov Min Jour*—April, 1909. No. 4745 B.

The Mining Industry of Queensland. General review of industry for 1908 from report of Under-Secretary for Mines. Ills. 2900 w. *Aust Min Stand*—April 28, 1909. No. 5395 B.

Austria.

Mining in the Austrian Alps (Montanistische Streifzüge durch die Alpenländer). Alfons Müllner. A description of the mining and smelting industries. Ills. Serial, 1st part. 3500 w. *Oest Zeitschr f Berg u Hüttenwesen*.—Jan. 30, 1909. No. 2672 D.

Bolivia.

Mining Conditions in Bolivia. J. Wilson Williams. Information concerning the minerals, mining regulations, and mining industry. 2000 w. *Min Jour*—June 26, 1909. No. 6272 A.

British Columbia.

Mining in British Columbia. A general review of the industry. Ills. 9000 w. *B C Min Rec*—Aug., 1908. No. 82 B.

Mineral Production of British Columbia in 1908. E. Jacobs. Reports a decrease of over \$2,000,000 in total value, with an increase in lode gold, copper, silver and zinc. 5000 w. *Eng & Min Jour*—Jan. 30, 1909. No. 2173.

Southeastern British Columbia. J. A. Ohren. A résumé of the mining industry for the year 1908. 3500 w. *Can Min Jour*—Jan. 1, 1909. No. 1459.

Calcium Sulphate.

The Behavior of Calcium Sulphate at Elevated Temperatures with Some Fluxes. H. O. Hofman and W. Mostowitsch. An account of an investigation to study the behavior of gypsum when exposed to elevated temperatures, both alone and in

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the presence of fluxes. 7300 w. *Bul Am Inst of Min Engrs*—Jan., 1909. No. 2423 F.

The Behavior of Calcium Sulphate at Elevated Temperatures with Some Fluxes. H. O. Hofman and W. Mostowitsch. Postscript to a paper published in the *Jan. Bulletin* giving a new investigation of the decomposition of ferric oxide by heating in dry air. 400 w. *Bul Am Inst of Min Engrs*—July, 1909. No. 6475 F.

California.

Historical Geology of California. William Forstner. Aims to collect and epitomize the literature on this subject. Ills. 3500 w. *Min & Sci Pr*—June 19, 1909. Serial. 1st part. No. 5826.

Canada.

The Mineral Production of Canada in 1908. John McLeish. Review giving tabulated statistics and comments. 2500 w. *Eng & Min Jour*—March 13, 1909. No. 3121.

The Taxation of Mineral Resources in Canada. O. D. Skelton. Reviews the measures adopted, with comments. 3500 w. *Can Min Jour*—Nov. 1, 1908. No. 44.

A Visit to the Mineral Districts of Canada. William Frecheville and Hugh F. Marriott. Notes on an excursion organized by the Canadian Mining Institute, describing the districts visited. 1000 w. *Inst of Min & Met, Bul.* 51—Dec. 10, 1908. No. 1340 N.

Notes on Plant in the Mining Districts of Canada. R. E. Commans. A general idea of the plant at mines visited during the excursion organized by the Canadian Institute. 7000 w. *Inst of Min & Met, Bul.* 51—Dec. 10, 1908. No. 1341 N.

The Occurrence and Mining of Coal and Metals in Canada (Vorkommen und Gewinnung von Kohle und Erz in Kanada). Ernst Kraynik. Report of one of the German representatives on the recent tour of the Canadian Mining Institute. Ills. Serial. 1st part. 5500 w. *Glückauf*—April 24, 1909. No. 4872 D.

Charcoal Furnaces.

A Typical Hanging Rock Charcoal Furnace. An account of the ten-ton Jefferson furnace at Oak Hill, O. Ills. 2500 w. *Ir Trd Rev*—Aug. 5, 1909. No. 6914.

China.

Mining in Northern China. F. L. Cole. A general review of the present condition of the mining industry. Map. 2000 w. *Min & Sci Pr*—April 24, 1909. No. 4347.

Colombia.

Economic Conditions in Colombia. F.

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Colorado

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The Mines of Colombia. Notes on a recent report of Mr. Stronge, the British Minister at Bogata, on the mines and minerals. 1600 w. *Engr, Lond*—July 23, 1909. No. 6858 A.

Colorado.

Colorado in 1908. Forbes Rickard. A review of the history of mining and metallurgical industries during the year, showing progress in the face of adverse conditions. Ills. 1200 w. *Min & Sci Pr*—Jan. 2, 1909. No. 1629.

Geology of the Mineral Resources of Colorado. Arthur Lakes. Briefly considers coal, artesian wells, clays, cement, building and flag stones, silver, lead and gold, marble, some rare metals and petroleum. 2500 w. *Min Wld*—May 22, 1909. No. 4936.

Crystallography.

Peculiar Crystalline Forms of Minerals and Metals. Arthur Lakes. Illustrated descriptions of interesting specimens. 1500 w. *Min Wld*—May 1, 1909. No. 4397.

Earthquakes.

Geological Fractures in the Calabria-Sicily Region (Fratture geologiche della Regione Calabro Sicula). E. Cortese. Discusses the geological structure with reference to the recent earthquakes. Ills. 6600 w. *Ann d Soc d Ing e d Arch Ital*—March 1, 1909. No. 4241 F.

England.

Presidential Address of James Charles Inglis. Deals principally with transport and the relation of engineering. Specially reviewing the railway conditions of the United Kingdom. Appendices. 11500 w. *Inst of Civ Engrs*—Nov. 3, 1908. No. 6446 N.

Exposition.

Alaskan Mineral Exhibit at A-Y-P Exposition. E. Jacobs. Shows the wealth of Alaska, and gives outline of the history of mining there. Ills. 2500 w. *Eng & Min Jour*—Aug. 28, 1909. No. 7390.

The Alaska-Yukon-Pacific Exposition. E. Jacobs. An illustrated article describing the mineral exhibits of the United States, Alaska and Canada. 2500 w. *Eng & Min Jour*—Aug. 21, 1909. No. 7183.

The Mineral Exhibit at the Alaska-Yukon-Pacific Exposition. E. Jacobs. Deals principally with the exhibits of Canada. 4000 w. *Can Min Jour*—Aug. 15, 1909. No. 7160.

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Jamaica

Fissures.

The Laws of Fissures. Blamey Stevens. Presents a theory of the formation of fissures, and data supporting it. 4000 w. *Bul Am Inst of Min Engrs*—Aug., 1909. No. 7126 F.

Geological Survey.

The Technologic Branch of the United States Geological Survey. George S. Rice. An illustrated article explaining its work and aims, and describing the experimental plant at Pittsburg. 5000 w. *Mines & Min*—May, 1909. No. 4476 C.

Geology.

Meteor Crater. John B. Hastings. Illustrated account of an interesting phenomenon in Arizona. 2000 w. *Min & Sci Pr*—April 10, 1909. No. 3972.

German East Africa.

The Ore Deposits of German East Africa (Die Nutzbaren Lagerstätten Deutsch-Ostafrikas). G. Gagel. A brief description of the deposits of economic value. 2700 w. *Glückauf*—July 17, 1909. No. 7273 D.

Great Britain.

Our Mineral Statistics. A review of the Mines and Quarries. General Report and Statistics for 1907, with the exception of the coal and iron trades. 3000 w. *Eng'r, Lond*—Nov. 20, 1908. No. 741 A.

Greece.

Mining Industry of Greece. George Horton, U. S. Consul. Brief discussion of conditions of the industry. 1100 w. *Min Wld*—June 5, 1909. No. 5381.

Haiti.

The Mineral Resources of Haiti, West Indies. Edw. G. W. Ferguson. Reviews the early history to explain the slow development of this island, and gives brief descriptions of the known deposits. 4000 w. *Min Wld*—July 10, 1909. No. 6263.

Idle Claims.

Paralysis of Mining Districts. Edmund B. Kirby. Address before the Am. Min. Cong. Discusses the loss from idle claim-owners, and the remedy. 3500 w. *Min & Sci Pr*—Oct. 2, 1909. No. 8410.

The Paralysis of Mining Districts and a Remedy. Edmund B. Kirby. Read before the Am. Min. Cong. Urges the increase of taxation until every claim must be worked or opened to prospectors. 2500 w. *Min Wld*—Oct. 16, 1909. No. 8714.

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Mineral Deposits of Jamaica in West Indies. Francis C. Nicholas. Nearly all

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Japan

the common minerals are found. Ocher and clay give promise of becoming important. 2000 w. *Min Wld*—Dec. 12, 1908. No. 1034.

Japan.

The Mining Industry in the Hokkaido, Japan. Report of British Vice-Consul Parlett, giving information of mines, conditions, wages, etc. 2500 w. *Min Jour*—April 10, 1909. No. 4032 A.

Korea.

Mining in Korea. Abstract of a consular report by Mr. Sammons. Considers the mining laws and regulations, and the gold mines and placers in the present article. 2500 w. *Min Jour*—May 15, 1909. Serial. 1st part. No. 4957 A.

Land Classification.

The Mining Man's Interest in Land Classification. George Otis Smith. Address before the Am. Min. Cong. Explains the advantages of this work carried out by the Geological Survey. 2000 w. *Min & Sci Pr*—Oct. 9, 1909. No. 8736.

Metal Production.

The World's Annual Metal Crop. Theo. F. Van Wagenen. A review of the metals now known, and their uses, and the wonderful progress recently made in the production of the true metals. 5500 w. *Pop Sci M*—March, 1909. No. 2920 C.

Mexican Law.

The Proposed New Mining Law of Mexico. Richard E. Chism. Discusses the provisions of a new law which is to govern mining titles and mines. 4000 w. *Eng & Min Jour*—July 31, 1900. No. 6792.

Mexico.

A Brief Review of the Mining Industry of Mexico. Ezequiel Ordoñez. An account of mining conditions. 4000 w. *Ec-Geol*—Dec., 1908. No. 1875 D.

Physical and Geological Features of Mexico Mining. Ezequiel Ordonez. Description, with explanation of the six types of ore deposits that include the great producers of gold, silver, copper, lead, zinc, antimony and tin. 1500 w. *Min Wld*—July 3, 1909. No. 6138.

Geology of Northern Mexico. R. H. Burrows. Divides the territory into three regions; the present number describes the Eastern. Ills. 4000 w. *Min & Sci Pr*—Aug. 28, 1909. Serial. 1st part. No. 7511.

A Classification of the Ore Deposits of Mexico. Ezequiel Ordoñez. Briefly describes the mountain systems and the principal ore deposits. 1600 w. *Min Jour*—March 20, 1909. No. 3611 A.

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Protection of Mexican Investors. F. J. H. Merrill. A discussion of mining titles and points that have been matters of dispute. 2000 w. *Min & Sci Pr*—April 3, 1909. No. 3829.

Changing Conditions in Mexico. H. A. Megraw. Brief account of the changes in labor conditions. 1500 w. *Eng & Min Jour*—Oct. 2, 1909. No. 8270.

Mineralogy.

Simple Mineral Tests and How to Make Them. Gordon Surr. Describes a few simple tests that can be made by prospectors. 2500 w. *Min Wld*—Aug. 14, 1909. No. 7079.

Mineral Springs.

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The Eruption of the Waimata Mud-Springs. James Henry Adams. Describes the location and discusses the probable origin of the springs. 3 maps. 2800 w. *N Z Mines Rec*—Oct. 16, 1908. No. 1000 B.

Nevada.

Nevada in 1908. J. H. G. Wolf. A review of the mining industry during the past year. 3500 w. *Min & Sci Pr*—Jan. 2, 1909. No. 1626.

Newfoundland.

Mineral Resources of Newfoundland. Map and General review with article by James P. Howley on the "Coal Areas of Newfoundland." Ills. 5000 w. *Can Min Jour*—Aug. 1, 1909. No. 6877.

New York.

The Mineral Production of New York in 1908. D. H. Newland. Gives statistics, showing the effect of the financial depression. 1600 w. *Eng & Min Jour*—June 26, 1909. No. 6007.

New Zealand.

Outline of New Zealand Geology. James Park. A general review of the geology of the country. The present number deals mainly with the physiographic features. 3000 w. *N Z Mines Rec*—Feb. 16, 1909. Serial. 1st part. No. 3883 B.

New Zealand as a Mining Country. James Mackintosh Bell. Map and illustrated discussion of the possibilities, reviewing important mines. 4000 w. *Aust Min Stand*—Nov. 25, 1908. No. 1687 B.

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The Minerals of Nova Scotia During 1908. A. S. Barnstead. A review of the production of coal, gold, iron, gypsum,

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and other minerals. 2500 w. Can Min Jour—Feb. 1, 1909. No. 2294.

Ore Deposits.

A Genetic Classification of Minerals. William H. Emmons. Indicates briefly the principal conditions under which the most important minerals are formed, giving tables and explanatory notes. 4500 w. Ec-Geol—Oct.-Nov., 1908. No. 482 D.

The Formation and Enrichment of Ore-Bearing Veins. George J. Baneroff. Supplementary to a paper read April, 1907, giving results of further study. 3300 w. Bul Am Inst of Min Engrs—July, 1909. No. 6473 F.

Modern Ancient Volcanoes and Ore Deposits. Arthur Lakes. A study of the relation between igneous intrusive rocks and ore occurrence. Ills. 2500 w. Min Wld—March 27, 1909. No. 3545.

Ores in Volcanic Craters and Fumarole Orifices. Arthur Lakes. Describes examples showing how varied are the methods of ore occurrences. Ills. 2000 w. Min Wld—March 6, 1909. No. 3019.

A Theory of Volcanic Action and Ore Deposits. Their Name and Cause. Hiram W. Hixon. The basis of the theory is that the earth was at one time an incandescent sun. Applies the law of diffusion of gases. 5000 w. Inst of Min & Met, Bul 52—Jan. 14, 1909. No. 2427 N.

Discussion on "A Theory of Volcanic Action and Ore Deposits, Their Nature and Cause" by Hiram W. Hixon, and on "The Silver Islet Vein, Lake Superior" by Walter McDermott. 17500 w. Inst of Min & Met, Bul 53—Feb. 11, 1909. No. 3159 N.

The Ore Occurrence and Origin of Cave Mines. Arthur Lakes. Illustrates and describes remarkable occurrences in Colorado. 1600 w. Min Wld—April 17, 1909. No. 4019.

Occurrence of Ore Deposits in Mineral Belts. Arthur Lakes. An illustrated geological study. 2200 w. Min Wld—April 10, 1909. No. 3874.

The Depth and Continuity of Fissure Veins. Arthur Lakes. Describes characteristics of different veins examined and phases of their history. 2500 w. Min Wld—Aug. 14, 1909. No. 7078.

Experiments on the Separation of the Constituents of a Solution by Filtration Through a Mineral Filter. Eugene C. Sullivan. Describes experimental work at the chemical laboratory of the U. S. Geol. Survey. 2000 w. Ec-Geol—Dec., 1908. No. 1879 D.

Ores Formed By Magmatic Segregation. F. Lynwood Garrison. Reviews the

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theories advanced in regard to ore deposits, especially considering iron ores and studying the process of magmatic segregation in meteorites. 6000 w. Min & Sci Pr—March 27, 1909. No. 3678.

The Association of Ores and Country Rock. Gordon Surr. Notes on the occurrences of various minerals. 3500 w. Min Wld—March 13, 1909. No. 3124.

Distribution of Metals and Minerals in Ore Shoots. Gordon Surr. Considers causes of the uneven distribution. 2500 w. Min Wld—Feb. 27, 1909. No. 2867.

A New Theory of the Genesis of Brown Hematite Ores; and a New Source of Sulphur Supply. Charles Cattlett's discussion of the paper by H. M. Chance. 1500 w. Bul Am Inst of Min Engrs—Nov., 1908. No. 689 C.

Metallogenetic Epochs. Waldemar Lindgren. Read before the Can. Min. Inst. A critical examination of mineral deposits and the principal epochs of the segregation of metals in North America. 4000 w. Can Min Jour—July 15, 1909. No. 6406.

Interesting Little Black Dikes. Arthur Lakes. Describes igneous rock found associated with rich ore deposits in Idaho and other places. 1500 w. Min Wld—July 24, 1909. No. 6655.

Garnet Contact Deposits of Copper and the Depths at Which They Are Formed. Charles R. Keyes. A study of the conditions producing garnetization. Ills. 2500 w. Ec-Geol—June, 1909. No. 6744 D.

Some Phenomena of the Folding of Rock Strata. Frank L. Nason. A study of rock formation in the Rocky Mts. and their extension into Mexico, their mineralization and related subjects. 4500 w. Ec-Geol—Aug., 1909. No. 7887 D.

An Instance of Secondary Impoverishment. Henry Hobart Knox. Describes an occurrence of unoxidized iron sulphides which have been leached of their copper contents. 3500 w. Inst of Min & Met, Bul 52—Jan. 14, 1909. No. 2428 N.

The Many Varied Occurrences of Ore in Veins. Arthur Lakes. Illustrates and describes some of the common variations. 1500 w. Min Wld—Feb. 20, 1909. No. 2575.

The Formation of Specular Iron Ore (Zur Bildung von Eisenglanz). H. Wölbling. Describes the chemical actions necessary to produce this mineral. 2600 w. Glückauf—Jan. 2, 1909. No. 2673 D.

The Relation of Copper to Pyrite in the Lean Copper Ores of Butte. James F. Simpson. Gives results of investiga-

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tions. Ills. 1800 w. *Ec-Geol*—Oct.-Nov., 1908. No. 483 D.

The Silver Islet Vein, Lake Superior. Walter McDermott. Reprint of an article published in 1877 which describes ore deposits of interest in connection with the present experience of mining at Cobalt. 5000 w. *Inst of Min & Met*, Bul 52—Jan. 14, 1909. No. 2429 N.

Ozark Lead and Zinc Deposits: Their Genesis, Location, and Migration. Charles R. Keyes. Outlines the principal hypotheses advanced to explain their origin, the geology of the formations, geographic distribution, and a study in general of the salient features. Ills. 14500 w. *Bul Am Inst of Min Engrs*—Feb., 1909. No. 2748 D.

The Lead-Silver Deposits at Newburyport, Massachusetts, and Their Accompanying Contact-Zones. C. H. Claff and W. G. Ball. Gives the history, topography, general geology, describing ore deposits and their origin. 3800 w. *Ec-Geol*—April, 1909. No. 4672 D.

Origin of Cobalt Silver Ores of Northern Ontario. Reginald E. Hore. Gives results of study in field and laboratory, and conclusions. 4000 w. *Ec-Geol*—Oct.-Nov., 1908. No. 481 D.

Features of a Vein Formation in Nicaragua. H. E. West. Describes the vein-system and orebodies which apparently are the results of the fracture and decomposition of effusive rocks. Ills. 3000 w. *Eng & Min Jour*—June 5, 1909. No. 5297.

The Localization of Values in Ore Bodies and the Occurrence of Shoots in Metalliferous Deposits. Hjalmar Sjögren. Notes concerning the Scandinavian copper and lead-silver mines. 2500 w. *Ec-Geol*—Oct.-Nov., 1908. No. 484 D.

See also Lake Superior, under COPPER; Nevada, and Rand, under GOLD AND SILVER; Tin, Tungsten, and Asbestos, under MINOR MINERALS.

Ores.

What Is an Ore? James F. Kemp. Read before the Can. Min. Inst. An examination of the term in its technical sense, and in the scientific sense. 4500 w. *Min & Sci Pr*—March 20, 1909. No. 3506.

Papua.

Mining District, Port Moresby, Papua. P. N. Charpentier. Deals with the geological features and the purchase of ore. 2000 w. *Aust Min Stand*—March 3, 1909. No. 3882 B.

Peru.

The Mineral Features of Tayacaja, Ancaraes, and Huancavelica, Peru. En-

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rique J. Dueñas. The present article describes the province of Tayacaja. 2500 w. *Min Jour*—March 27, 1909. Serial. 1st part. No. 3785 A.

Porto Rico.

Notes on Some Ore Deposits of Porto Rico. S. Harbert Hamilton. Notes on the topography and geology of the island, describing the iron, copper, and other deposits. Ills. 1200 w. *Eng & Min Jour*—Sept. 11, 1909. No. 7684.

Refractory Materials.

Conductivity, Porosity, and Gas Permeability of Refractory Materials. S. Wologdine and A. L. Queneau. Deals with the conductivities of a number of refractory materials in the present article. 2500 w. *Elec-Chem & Met Ind*—Sept., 1909. Serial. 1st part. No. 7591 C.

Refractory Materials (Les Produits réfractaires). Louis Baraduc-Muller. Read before the Congress of Applied Chemistry. A general discussion, results of researches and a detailed consideration of the principal classes. 1500 w. *Rev de Métal*—June, 1909. No. 6510 E + F.

Researches on the Conductivity, Porosity, and Permeability of Refractory Materials (Recherches sur la Conductibilité, la Porosité et la Perméabilité des Matières réfractaires). S. Wologdine. Read before the Congress of Applied Chemistry. A report of extended investigations. Ills. 15000 w. *Rev de Métal*—June, 1909. No. 6515 E + F.

Respirators.

The Improvement of Respirators (Ein Beitrag zur Verbesserung von Staubschutzrespiratoren). Árpád Kriz. A description of various types. Ills. 2200 w. *Oest Zeitschr f Berg u Hüttenwesen*—Jan. 23, 1909. No. 2671 D.

Review of 1908.

Mining and Metallurgy in 1908. Editorial review. 7000 w. *Min Jour*—Dec., 26, 1908. No. 1532 A.

Mining in the United States During 1908. Reviews progress at the various camps. Maps. 12,400 w. *Eng & Min Jour*—Jan. 9, 1909. No. 1585.

Mineral and Metal Production in 1908. A summary of the production of the more important minerals and metals in the United States. 700 w. *Eng & Min Jour*—Jan. 9, 1909. No. 1578.

Review of Mining in the United States in 1908. The various mining districts are reviewed by different authors. 88000 w. *Min Wld*—Jan. 30, 1909. No. 2185.

MINING AND METALLURGY

Review of 1908

Profits of American Mines in 1908. Editorial, showing that in spite of adverse conditions the sum of \$51,581,092 was paid to shareholders. Also progress and improvements during the year. 4000 w. Min Wld—Jan. 30, 1909. No. 2184.

Review of Mining in Foreign Countries. Reviews the developments of the past year in the Transvaal, Peru, Chile, Colombia, Mexico, Ontario and Australia. 17000 w. Eng & Min Jour—Jan. 9, 1909. No. 1586.

The Mining Market in 1908. Briefly reviews the general characteristics of the year and the course of the market. 3000 w. Min Jour—Jan. 2, 1909. Serial. 1st part. No. 1702 A.

The Metals in 1908. A review of the past year in connection with the markets. Copper and tin are considered in this number. 4000 w. Min Jour—Jan. 23, 1909. Serial, 1st part. No. 2215 A.

South America.

A Review of Mining in Latin America. 2500 w. Min Jour—Sept. 4, 1909. No. 7740 A.

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The Mines of South Carolina. H. L. Scaife. Information concerning the mineral occurrence and workings, with bibliography. 2000 w. Eng & Min Jour—Dec. 19, 1908. No. 1052.

Santo Domingo.

Some Investigations of Santo Domingo Minerals. C. W. Kempton. Illustrated article describing the topography, climate, and features of the island, and reporting the results of explorations. Gold, lead, copper, and amber were found. 1000 w. Min Wld—March 27, 1909. No. 3746.

Sulphuric Acid.

Sulphuric Acid Lead Chamber Construction. Frederic J. Falding. Illustrates and describes the principle of a modern type of chamber, claiming increased efficiency. 2500 w. Eng & Min Jour—Sept. 4, 1909. No. 7563.

Transportation.

Transportation in Its Relation to the Mining Industry. Dr. James Douglas. Discusses the interdependence of the transportation and mining industries, and the intense activity that is using up the natural resources of the country. 4500 w. Pro Am Min Cong—1908. No. 4123 N.

Transportation of Mineral Products. Edward H. Harriman. Shows the importance of mine products as a factor in transportation, discussing their relation

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to the railroads, and related subjects. 5000 w. Pro Am Min Cong—1908. No. 4119 N.

The Influence of the Railroads of the United States and Canada on the Mineral Industry. James Douglas. Reviews the history of the Oregon boundary dispute and early railway projects, the routes of the railways, the distribution of mineral traffic, and related information. 21000 w. Inst of Min & Met, Bul 58—July 8, 1909.

Turkey.

Mineral Resources of the Turkish Empire. Leon Dominian. Describing the mineral deposits known, and their location. Map. 4500 w. Min & Sci Pr—June 12, 1909. No. 5589.

United States.

Distribution of the Nation's Mineral Wealth. George Otis Smith. Remarks on production statistics and the effect of the wide distribution of raw materials. 1200 w. Pro Am Min Cong—1908. No. 4140 N.

Relation of the Federal Government to Mining. Charles Dick. Shows the necessity of work for the prevention of accidents, loss of life, and prevention of waste, and other problems of mining and metallurgy, urging investigation by the U. S. Government. 8000 w. Pro Am Min Cong—1908. No. 4118 N.

The Federal Government in Its Relation to the Mining Industry. Hon. James Rudolph Garfield. Reviews what the government has done and proposes to do in work connected with the mining industry. 3500 w. Pro Am Min Cong—1908. No. 4124 N.

The Duties of the Federal and State Governments in Relation to the Mining Industry. W. F. Englebright. Remarks favoring the establishment of a mining bureau. 1200 w. Pro Am Min Cong—1908. No. 4142 N.

The Duties of the Federal and State Governments in Relation to the Mining Industry. George Harrison. Recommends the establishment of a National Bureau of Mines, to investigate mining conditions and secure information pertaining to safe and economic mining. 3000 w. Pro Am Min Cong—1908. No. 4121 N.

Mines and Minerals in the New England States. C. W. Kempton. Brief illustrated description of ore deposits discovered. 1200 w. Min Wld—May 1, 1909. No. 4399.

How It Strikes an American. T. Lane Carter. A comparison of mining conditions in America and South Africa.

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U. S. Geological Survey

Ills. 3000 w. Min & Sci Pr—March 27, 1909. Serial, 1st part. No. 3677.

See also Natural Resources, under INDUSTRIAL ECONOMY.

U. S. Geological Survey.

Work of the United States Geological Survey in 1908. 2500 w. Eng & Min Jour—Jan. 23, 1909. No. 2036.

Utah.

Mineral Resources of Utah. Robert H. Bradford. Abstract of paper read before the Am. Min. Cong. Reviews the production of the more important mines. Lead, silver, gold, copper and valuable

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non-metallic minerals, salt, coal, asphalt and other deposits are found. 2000 w. Min & Sci Pr—Jan. 30, 1909. No. 2291.

Some Utah Mineral Deposits and Their Metallurgical Treatment. Robert H. Bradford. Reviews the present state of Utah's mining and metallurgical industries. 5500 w. Pro Am Min Cong—1908. No. 4126 N.

Virginia.

The Mineral Resources of Virginia. E. A. Schubert. A general discussion of their economic value. 8500 w. Pro Am Min Cong—1908. No. 4128 N.

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Accidents

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Accidents.

American Railway Accidents. Gives statistics for the years 1907 and 1908, and quotes comments of Interstate Commerce Commission. 1500 w. Engr, Lond—June 18, 1909. No. 6049 A.

Publicity for Railroad Accidents. W. L. Park. Considers means of reducing avoidable accidents. Also general discussion. 16000 w. Pro W Ry Club—March 12, 1909. No. 4083 C.

The Railway, the Man, and the Accident. J. O. Fagan. From a paper before the Am. Anti-Accident Assn. A discussion of the responsibility for accidents of the American railway employee. 2000 w. R R Age Gaz—April 30, 1909. No. 4370.

Decrease in Railway Fatalities in 1908. Editorial discussing railway accidents in Great Britain and the United States. 1000 w. Engng—May 28, 1909. No. 5261 A.

A Trainmaster's View Point. Fred C. Letts. Explaining some of the difficulties encountered. 3000 w. R R Age Gaz—Sept. 10, 1909. No. 7697.

The Safety of British Railways. Reviews the accident records for various years and Acts passed that have a bearing on the safety of railways. 1600 w. Engr, Lond—Jan. 8, 1909. No. 1825 A.

The Crawford Derailment. Discusses this accident and also Colonel Yorke's report upon it. 1500 w. Engr, Lond—July 2, 1909. No. 6310 A.

Automatic Stops.

See Signalling, under CONDUCTING TRANSPORTATION.

Communication.

Telegraph Service on Railways (Etude du Service Télégraphique dans les Chemins de Fer). M. Pellarin. Report of a commission appointed to study conditions in Belgium, Italy, Switzerland, and Holland. 4000 w. Ann d Ponts et Chaussées—1908-III. No. 505 E + F.

Derailments.

A Study of the Stability of Railway Rolling Stock (Etude complémentaire sur la Stabilité du Matériel des Chemins de Fer). Georges Marié. Presents a complete theory of derailments and a discussion of its importance in connection with the design of tire profiles. Ills. 14000 w. Mem Soc Ing Civ de France—May, 1909. No. 6502 G.

Dispatching.

The Train Despatcher's Status. J. F. Mackie. From a paper read at Columbus meeting of the Train Des. Assn. Brief review of the development of the service with the increase in traffic. 1500 w. R R Age Gaz—July 16, 1909. No. 6380.

Telephone Train Dispatching. Discusses the elements that make up an operative system. 2500 w. Sig Engr—Jan., 1909. No. 1837.

The Telephone for Train Dispatching. W. E. Harkness. Presents the advantages of the telephone over the telegraph for dispatching purposes, giving information of installations and their working. Discussion. 1300 w. Pro St Louis Ry Club—Feb. 12, 1909. No. 2928.

Signalling.

Railway Signaling. James B. Latimer. An elementary explanation of the uses of

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the various signals, the principles of the track circuit, etc. 2500 w. *Sig Engr*—Feb., 1909. Serial, 1st part. No. 2540.

Report on Signaling Practice. Report of Committee presented at recent meeting of the Ry. Sig. Assn. at Louisville, Ky. Ills. 1700 w. *R R Age Gaz*—Oct. 15, 1909. Serial, 1st part. No. 8812. *R Age Gaz*—Sept. 10, 1909. No. 7695.

Systematic Signaling. C. C. Anthony. Discusses the standard codes of block signals and interlocking rules, and the proposals submitted by the Signal and Maintenance of Way Assns. 5000 w. *R*

Automatic Railroad Protection. Snowden B. Redfield. Illustrates and describes mechanical and electrical devices for the control of switches and signals. 4500 w. *Am Mach*—Vol. 32, No. 32. No. 7009.

The Appeal of the Railway Signal. Brief explanation of the principles of the automatic signal and of the interlocking system, describing the systems discussed at the recent Chicago meeting of the Ry. Sig. Assn. Ills. 1200 w. *Ry & Loc Engng*—May, 1909. No. 4416 C.

The A B C of Railroad Signaling. W. H. Elliott. An explanatory outline of practice in the United States. 4000 w. *Sig Engr*—June, 1909. Serial. 1st part. No. 5675.

Railway Signaling. James B. Latimer. Illustrated detailed description of the operation of interlocking machines. 5000 w. *Sig Engr*—April, 1909. Serial, 1st part. No. 3999.

The First Block Signal System in America. J. A. Anderson. An account of the system devised and put in operation by Ashbel Welch. Ills. 2800 w. *R R Age Gaz*—March 5, 1909. No. 3033. *Engr*—Aug., 1909. No. 7065.

The State of the Art of Railway Signalling. J. P. Simmen. A general review, with a description of the Simmen system. 4500 w. *Can Engr*—Nov. 20, 1908. No. 405.

Railway Signalling: Its Defects, and Suggestions for Removing Them. A. Gardiner. Abstract of paper before Leeds Loc. Soc. of Inst. of Elec. Engrs. Describes the author's system of train working with engine cab signals. 2000 w. *Elect'n, Lond*—Nov. 6, 1908. No. 313 A.

First Annual Report of the Block Signal and Train Control Board to the Interstate Commerce Commissions. Ills. 38000 w. *Bul Int Ry Cong*—June, 1909. No. 6459 G.

First Annual Report of the Block Signal and Train Control Board to the In-

terstate Commerce Commission. 24000 w. *Sig Engr*—Feb., 1909. No. 2541.

Block Signal and Control Board: First Annual Report to the Interstate Commerce Commission. The report of a board appointed to investigate the use and necessity for block signal systems and automatic control appliances on railways is given nearly in full. 8000 w. *Eng News*—Jan. 14, 1909. No. 1786.

Government Report of Block Signal Mileage. Information from a bulletin recently issued by the Interstate Commerce Commission. 4000 w. *R R Age Gaz*—May 14, 1909. No. 4658.

Railway Signalling. John Murphy. An investigation of railway signal systems and their operation with special reference to work needed in Canada. 4000 w. *Can Engr*—March 12, 1909. No. 3114.

Significance of Speed Signaling. George S. Hodgins. An explanation of proposed changes and their significance. 1400 w. *Ry & Loc Engng*—Oct., 1909. No. 8298 C.

Interlocking and Signalling. E. W. Oliver. Considers in detail some of the conditions of interlocking and signalling required at grade crossings of railways in Canada. Ills. 7500 w. *Can Engr*—July 30, 1909. No. 6786.

Controlled Manual Block Signaling. A. D. Cloud. Describes this system as used on some of the western roads. 3000 w. *Sig Engr*—Nov., 1908. No. 281.

The Maintenance of Mechanical Interlocking. T. W. Triplett. Suggestions for the inspection and maintenance of the plant. 2500 w. *Sig Engr*—Sept., 1909. No. 7829.

Automatic Block Signals. W. B. Kouwenhoven. Considers the operation of block signals on double-track roads only. 2000 w. *Ry & Loc Engng*—July, 1909. No. 6121 C.

Interlocking in Europe. Abstract of report by Adams and Ames, Interstate commerce commission. Outlines systems employed. Ills. 1800 w. *R R Age Gaz*—June 4, 1909. No. 5288.

Railway Signalling in Holland, Belgium, Switzerland, and Italy (Notes sur la Signalisation des Chemins de Fer—Hollande, Belgique, Suisse, Italie). Ed. Epinay. An exhaustive review of signal practice in these countries. Ills. 34000 w. *Ann d Ponts et Chauss*—1908-II. No. 2606 E + F.

A New Automatic Electric Signalling System for Railroads. Description of method used on The Great Western Railroad, England. Ills. 1200 w. *Sci Am*—Oct. 16, 1909. No. 8582.

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Difficulties With Track Circuits in Great Britain. From the report of Ames and Adams, Interstate Commerce Commission. Explains some difficulties not encountered in American practice. 800 w. R R Age Gaz—Feb. 19, 1909. No. 2548.

Wire Transmissions Laid in Pipes Filled with Oil for Operating Switches and Signals. L. Dufour. Describes this system of construction as installed at Grypskerk station, Holland. Ills. 1300 w. Bul Int Ry Cong—Nov., 1908. No. 897 G.

Experiments with Safety Appliances for Preventing Trains from Over-Running Signals Standing at "Danger." Capt. Gonell. Describes appliances under trial by the Prussian State Railways. Ills. 4000 w. Bul Int Ry Cong—Jan., 1909. No. 2435 G.

The Latest System of Power Railway Signalling. Illustrations and brief description of an all electric plant at Yarn-ton, near Oxford, on the Gt. Western Ry. 500 w. Engr, Lond—Aug. 27, 1909. No. 7663 A.

An Automatic Electric Fog-Signaling Apparatus for Railroads. Illustrated description of an apparatus being experimented with on the Belgian State Railways. 900 w. Sci Am—Sept. 18, 1909. No. 7801.

Electric Interlocking at the Orléans Station (L'Exécution d'Enclenchements provisoires par Serrures électriques sur le Réseau d'Orléans). M. Jullien. Describes an installation on the Bouré system. Ills. 2000 w. Rev Gen de Chemins de Fer—Aug., 1909. No. 7924 G.

"M. D. M." Auto-Combiner for the Hydraulic Control and Interlocking of Points and Signals at Cabin 11 of the Paris-Nord Railway, at Landy (Application de l'Auto-Combinateur "M. D. M." pour la Commande par Fluide et l'Enclenchement des Aiguilles et des Signaux à la Cabine No. 11 de Paris-Nord, Garage du Landy). Albert Moutier. Illustrated description. 11500 w. Rev Gen des Chemins de Fer—Sept., 1909. No. 8612 G.

The Lartigue Electric Semaphore (Electro Sémaphore Système Lartigue). J. A. Montpellier. Illustrated description. 3000 w. Elecn—March 13, 1909. No. 4224 D.

Some Applications of Electricity in Railway Service (Quelques Applications de l'Électricité au Service des Chemins de Fer). J. A. Montpellier. Describes various signalling devices. Ills. 5200 w. Elecn—March 27, 1909. No. 4226 D.

Recent Practice in the Interlocking of Railway Points and Signals (Les Procédés les plus récents d'Enclenchements des Sig-

naux et des Aiguilles). M. A. Moutier. Describes the mechanism and operation of various recent types of signalling apparatus. Ills. 8400 w. Mem Soc Ing Civ de France—Feb., 1909. No. 4808 G.

The Ciraolo Distant-Control Signal (Nota sul Sistema di Disco manovrato a Distanza inventato dall'Ing. Ciraolo). Ferruccio Celeri. An exhaustive description. Maps. 2400 w. Eng & Min tion. Ills. 6500 w. Ing Ferro—June 1, 1909. No. 6555 D.

The Martin Alternating-Current Inductor Train Staff System (Mit Wechselstrom-Induktoren betriebene Zugstabeinrichtung, Bauart L. Martin). L. Kohlfürst. Illustrated description. Serial 1st part. 3000 w. Schweiz Bau—March 13, 1909. No. 4267 B.

Safety Appliances on the Java Railways (Dutch Indies). L. Dufour. Describes the appliances adapted for interlocking the signals and switches on lines carrying but little traffic. Ills. 2200 w. Bul Int Ry Cong—Oct., 1908. No. 169 G.

Interlocking Facilities of the St. Louis Terminal Railroad Assn. of St. Louis. A. D. Cloud. An illustrated account of extensive improvements made to handle the traffic in connection with the World's Fair of 1904. 8000 w. Sig Engr—Jan., 1909. No. 1836.

New Automatic Signals on the Boston & Albany. Illustrated description of a recent installation of the Hall automatic block signals, between Westfield, Mass., and Rensselaer, N. Y. 1200 w. R R Age Gaz—Feb. 5, 1909. No. 2299.

Track Circuit Signals Without Insulated Joints. Describes this system which has been in use on the Long Island Railroad for six months. Ills. 1200 w. R R Age Gaz—Feb. 12, 1909. No. 2472.

New Interlocking Work on the Baltimore & Ohio R. R. Describes special features of recently installed plants. Ills. 1500 w. Ry & Engng Rev—Jan. 30, 1909. No. 2182.

The Weverton Signaling Installation on the Baltimore and Ohio Railroad. Illustrates and describes a new interlocking and signaling plant. 1800 w. Eng Rec—April 17, 1909. No. 4010.

Automatic Signals Near Washington, Baltimore & Ohio Railroad. Illustrates and describes this section, where the lighting of the signals is done automatically. 1600 w. Eng Rec—Aug. 7, 1909. No. 6954.

Washington Station Signal System. Brief illustrated description of the upper quadrant or three-position signal system

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installed. 1500 w. Ry & Loc Engng—April, 1909. No. 3656 C.

New Signals at Providence. Describes the changes in track layout, and interesting features of the signal system. Ills. 2200 w. R R Age Gaz—Oct. 8, 1909. No. 8449.

All-Electric Interlocking at Allentown. Illustrated description of this plant. 700 w. R R Age Gaz—June 18, 1909. No. 5613.

Federal Electric Interlocking at Indianapolis. Brief description of two all-electric interlocking plants recently installed. 1200 w. R R Age Gaz—June 25, 1909. No. 5886.

Block Signals in Des Moines, Iowa. Diagrams and description of a reliable block and danger signal in use. 1200 w. Elec Ry Jour—April 10, 1909. No. 3824.

Electric Train Staff on the Southern Pacific. An account of this system and its operation. 2500 w. R R Age Gaz—May 21, 1909. No. 4900.

Manual Block Signaling with the "A B C" System on Northern Pacific. Gives some details of the Northern Pacific practice and a comparison between the Alfred Beamer plan and other methods of train control. 3500 w. R R Age Gaz—Feb. 19, 1909. Serial, 1st part. No. 2543.

Movement of Trains on Single Track Without Train Orders. Synopsis of paper by George S. Pflasterer, read before the Nashville Assn. of R. R. Officers. Describes the main features of a successful system in operation between Wauhatchie and Chattanooga, in service 21 years. 1500 w. Sig Engr—April, 1909. No. 4000.

A Little Further Talk on Torque and Its Relations to an Upper Quadrant Signal. W. H. Lane. Discusses the conditions under which a signal must operate and the need of a standard design. 2000 w. Sig Engr—March, 1909. No. 3237.

Signal Lightning Arresters. E. E. F. Creighton. General consideration, with discussion of materials, tests, etc. Ills. 2500 w. Sig Engr—March, 1909. No. 3236.

The Semaphore; Upper Left vs. Upper Right. From a paper by C. H. Morrison, discussing the merits of different arrangements. Ills. 1400 w. R R Age Gaz—June 11, 1909. No. 5472.

Failures of Signal Apparatus, Reporting, Repairing, Recording. H. S. Balliet. Explains the system in effect on the electric division of the N. Y. C. & H. R. railroad. 3500 w. Sig Engr—May, 1909. No. 4701.

Concerning the Handling of Wire. Stanley C. Bryant. Illustrated suggestions for

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the handling of copper wire and the manner of making joints and tops in signal work. 1800 w. Sig Engr—June, 1909. No. 5676.

Track Circuits and Batteries. George S. Hodgins. Explains the arrangement and operation of automatic signals. 2000 w. Ry & Loc Engng—June, 1909. No. 5234 C.

The Use of Alternating Currents in Railway Signaling. W. K. Howe. Read before the Ry. Sig. Assn. Explains the advantages as compared with direct current, illustrating the use of the A. C. track circuit as applied to electric traction roads. 3000 w. R R Age Gaz—July 9, 1909. Serial, 1st part. No. 6236.

The Resistances and the Application of Double-Wire Transmissions for Operating Switches and Signals at a Distance. L. H. N. Dufour. Particulars as to resistance to movement of the different switches and signals, and of parts of a wire-transmission system, discussing possible improvements. 9000 w. Bul Int Ry Cong—June, 1909. No. 6458 G.

The Perry-Prentice Wireless Signalling System. H. Avery Blair. Illustrated detailed description of this system. 4500 w. Sig Engr—Feb., 1909. No. 2539.

Trial of the Rowell-Potter Block Signals and Automatic Stop. Illustrated account of a system of automatic train control under trial on the C. B. & Q. R. R. 1800 w. Ry & Engng Rev—Dec. 26, 1908. No. 1282.

Signal Tower for Saxby & Farmer Machines. F. D. Chase. Plans and description of an interlocking tower. 600 w. Sig Engr—Aug., 1909. No. 7065.

See also Drawbridges, under CIVIL ENGINEERING, BRIDGES; Reinforced Concrete, under CIVIL ENGINEERING, CONSTRUCTION; Signal Lamps, under ELECTRICAL ENGINEERING, LIGHTING.

Surprise Tests.

Surprise and Efficiency Tests of Those Charged with the Operation of Trains. Frederick C. Syze. Gives statistics relating to loss of life and injuries on the railways of the United States, and discusses tests made to detect lax practice among employees. Discussion. 14000 w. Pro N. Y R R Club—Sept. 17, 1909. No. 8522.

Train Dispatching.

The A B C System of Train Dispatching. A. Beamer. Describes this system as used on the Northern Pacific Ry. 2200 w. Ry & Loc Engng—Dec., 1908. No. 796 C.

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Train Loads

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Train Loads.

The Adjusted Tonnage Formula for Determining Train Loads. Alexander P. Gest. An explanation of this method of determining proper train loads. 900 w. R R Age Gaz—Oct. 22, 1909. No. 8815.

Train Movements.

Mr. Metzels Diagram and That of the Belgian State Railway for Investigating the Utilization of Tracks at Passenger Stations. L. Weissenbruch and J. Verdeyen. 1600 w. Bul Int Ry Cong—Feb., 1909. No. 3276 G.

Train Operation.

Extension of the "A. B. C." Rules on Northern Pacific. An explanation of this system of train operation and the instructions for the change. 1500 w. R R Age Gaz—Nov. 6, 1908. No. 128.

Military Habits in Train Operation. W. L. Park. Especially considers the importance of efficient flagging of trains. 2000 w. R R Age Gaz—Feb. 19, 1909. No. 2544.

Trains.

New Royal Train, Great Northern Railway. Illustrated description of fine special saloons for the use of the King of England. 700 w. Engng—Nov. 27, 1908. No. 869 A.

The Southern Belle Express. Illustrated description of a fine train recently put in service on the L. B. & S. C. Ry. of England. 1000 w. Engr, Lond—Jan. 8, 1909. No. 1824 A.

Train Staff.

Train Staff Installation on the N. Y., N. H. & H. W. F. Follett. Illustrated description. 1200 w. Sig Engr—Sept., 1909. No. 7830.

Train Weights.

The Maximum Weights of Slow Freight Trains. C. S. Bissell. A study of data to determine the maximum train weight for slow freight. 2500 w. Pro Am Soc of Civ Engrs—Feb., 1909. No. 3461 E.

The Maximum Weights of Slow Freight Trains. Discussion of C. S. Bissell's paper. 1000 w. Pro Am Soc of Civ Engrs—May, 1909. No. 5111 E.

MOTIVE POWER AND EQUIPMENT

Air Brakes.

Development in Air Brakes for Railroads with a Brief Review of Past and Present Operating Conditions. W. V. Turner and S. W. Dudley. On the development and present state of the air-brake art. Also discussion. Ills. 45000 w. Pro N Y R R Club—April 16, 1909. No. 4756.

Southern Pacific Air Brake Tests. Abstract of a report, illustrating in detail the present state of air-brakes and their operation. Also editorial. Ills. 8000 w. R R Age Gaz—Dec. 4, 1908. Serial. 1st part. No. 805.

Percentage of Power Brakes on Trains. Discusses the proposed increase in the percentage of cars equipped with air brakes. 900 w. Am Engr & R. R. Jour—June, 1909. No. 5342 C.

High Brake Cylinder Pressures. G. W. Kiehm. Explains the action of air brakes and discusses the arguments for and against the employment of higher pressures. 1500 w. Ry & Loc Engng—Jan., 1909. No. 1447 C.

Broken Air Pipes with H-6 Brake. G. W. Kiehm. Directions for various possible breaks. 2000 w. Ry & Loc Engng—Feb., 1909. Serial, 1st part. No. 2266 C.

Leak at H-6 Brake Valve. Explains some air brake tests. 2500 w. Ry & Loc Engng—May, 1909. No. 4420 C.

H-6 Equalizing Discharge Valve. Explains the construction and operation of these brake valves. Ills. 3500 w. Ry & Loc Engng—Aug., 1909. No. 6871 C.

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Leaky Graduating Valve. Explains the action of a leaky graduating valve, and methods of testing. 2500 w. Ry & Loc Engng—July, 1909. No. 6120 C.

Continuous Brakes on Goods Trains. J. Doyen. Gives statistical information based on a paper by Mr. Staby. 1800 w. Bul Int Ry Cong—Jan., 1909. No. 2432 G.

The Question of the Proposed Trials of Goods-Train Brakes. A. Huberti and J. Doyen. Gives details of certain points relating to brake trials with continuous brakes. 4000 w. Bul Int Ry Cong—June, 1909. No. 6457 G.

Vacuum Brake Trials. Reports trials of the Hardy system on the lines of the Austrian state railways. Six tables. 4000

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Car Repairing

w. Bul Int Ry Cong—Jan., 1909. No. 2433 G.

Tests of Continuous Automatic Brakes on Goods Trains (Versuche mit durchgehenden selbsttätigen Bremsen bei Güterzügen). Johann Rihosek. A review of the tests on the Austrian State Railways. Ills. Serial. 1st part. 3600 w. Zeitschr d Oest Ing u Arch Ver—Sept. 24, 1909. No. 8691 D.

The Application of Automatic Continuous Brakes to Goods Trains (Sull' Applicazione di Freni continui automatici ai Treni Merci). Ferruccio Celeri. An elaborate discussion of the whole problem. Ills. 20000 w. Ing Ferro—Feb. 26, 1909. No. 3355 F.

Air Brake Valves.

H6 Distributing Valve Test. Describes tests to determine the condition and locate defects. Ills. 2500. Ry & Loc Engng—Sept., 1909. No. 7578 C.

Air Pumps.

Care of the Air Pump. G. W. Kiehlm. Suggestions for repairs and care. 1500 w. Ry & Loc Engng—Nov., 1908. No. 9 C.

Axle Boxes.

Questions of Economy and Improvement in Axle Boxes for Railway Rolling Stock (Einiges zur Verbesserungs- und Wirtschaftlichkeitsfrage der Achsbüchsen der Eisenbahn-Betriebsmittel.) Herr Erdbrink. An exhaustive and elaborately illustrated discussion. 8000 w. Glasers Ann—April 15, 1909. No. 5056 D.

Axles.

A Differential Joint for Railway Car Axles. Illustrated description of a device for jointing railway car axles to permit independent rolling of the two wheels. 900 w. Eng News—Feb. 4, 1909. No. 2278.

Baggage Trucks.

The Economy of Power Baggage Trucks for Station Platforms (Die Wirtschaftlichkeit der Bahnsteig-Gepäckaufzüge bei verschiedener Betriebsweise). Fritz Landsberg. Examines the cost of hydraulic and electrically operated systems. 2300 w. Glasers Ann—Feb. 1, 1909. No. 3394 D.

Brakes.

Brake Shoe Friction. G. W. Kiehlm. Explains the results of forcing a brake-shoe against a revolving wheel. 2000 w. Ry & Loc Engng—Dec., 1908. No. 794 C.

Brake Shoes.

Brake Shoe Testing Machine. Illustrated description of a machine by which brake shoes may be tested under conditions similar to actual service. 1200 w. R R Age Gaz—Feb. 26, 1909. No. 2778.

Car Ferries.

See Ferryboats, under MARINE AND NAVAL ENGINEERING.

Car Haulage.

Mechanical Car Haulage, a Collecting-Yard Novelty (Machinelle Wagen-Rangieranlagen, eine Neuerung für den Verschiebedienst). Herr Peter. Describes a system of endless wire-rope haulage for shifting railway cars about a yard. Ills. 3200 w. Glaser's Ann—June 1, 1909. No. 6587 D.

Car Heating.

Vapor Car Heating System. Illustrated description of the system invented by Edward E. Gold. 2200 w. Ry & Loc Engng—Jan., 1909. No. 1450 C.

Car Lighting.

Appliance for Putting in Place Inverted Mantles into the Lamps of Railway Passenger Carriages. Mr. Epstein. Illustrated description, 800 w. Bul Int Ry Cong—Feb., 1909. No. 3278 G.

An Oil-Gas Generating Plant (Oelgasanstalt mit Generatorbetrieb). Fritz Landsberg. Describes oil-gas generation, transmission, and utilization for car lighting on the Berlin Ringbahn. Ills. 4000 w. Zeitschr d Ver Deutscher Ing—Sept. 11, 1909. No. 8913 D.

See also Hand Lamps, under ELECTRICAL ENGINEERING, LIGHTING.

Car Oscillation.

The Oscillation of Articulated Cars (Untersuchungen über das unruhige Laufen der Drehgestellwagen). Herr Waddingen. A mathematical investigation of the causes. Ills. 3000 w. Glasers' Ann—March 1, 1909. No. 4274 D.

Car Painting.

Painting Steel Cars. George L. Fowler. Calls attention to points in the usual practice that help to account for the frequent poor results. 3500 w. R R Age Gaz—June 18, 1909. No. 5612.

Car Repairing.

Maintenance and Repair of Freight Cars. Full illustrated detailed description of methods used by the Pennsylvania Railroad, with special reference to steel equipment. 10000 w. Am Engr & R R Jour—March, 1909. No. 2963 C.

RAILWAY ENGINEERING

Car Trucks

MOTIVE POWER AND EQUIPMENT.

Electrification

Car Trucks.

Cast Steel Frames of the Arch-Bar Type for Car Trucks. Illustrated description of an arch-bar frame with the journal boxes cast as a part of the frame. 900 w. Eng News—Jan. 7, 1909. No. 1640.

Compressed Air.

Improvement of Compressed-Air Traction by the Utilization of the Heat Generated in Compressing the Air (*Amélioration de la Traction à Air comprimé par l'Utilisation de la Chaleur de Compression de l'Air*). L. Pierre-Guédon. Suggests means of improving the efficiency of compressed-air traction. Ills. 6000 w. Génie Civil—Sept. 11, 1909. No. 8631 D.

Couplers.

Polar Coupler on the Pennsylvania. Illustrated description of new coupler designed for new steel cars. 800 w. Ry & Loc Engng—Jan., 1909. No. 1451 C.

The Vinzio Semi-Automatic Coupler for Railway Cars (*Attelage partiellement automatique pour Vagons de Chemin de Fer, Système Vinzio*). Illustrated description. Serial. 1st part. 1200 w. Bul Tech d l Suisse Romande—March 25, 1909. No. 4227 D.

A New Automatic Coupler (*Eine neue selbsttätige Mittelpufferkuppelung*). K. Scharfenberg. Illustrated description of a new type used on a narrow-gauge road in Germany. 1800 w. Glasers Ann—May 1, 1909. No. 5783 D.

Derrick Cars.

See Erection, under CIVIL ENGINEERING, BRIDGES.

Draft Gear.

Southern Pacific Draft Gear Tests. A report of tests made on the Los Angeles division of the So. Pacific to show the advantage of the Westinghouse friction draft gear in freight service. 1800 w. R R Age Gaz—Jan. 8, 1909. No. 1650.

Dynamometer Cars.

Dynamometer Car of the University of Illinois and the Illinois Central Railroad. F. W. Marquis. Illustrated description of the newly equipped car and its records. 3000 w. R R Age Gaz—Feb. 19, 1909. No. 2545.

Electrification.

The Substitution of Electric Power for Steam on American Railroads. F. Darlington. A discussion with reference to American practice, concluding that self-preservation demands its progressive adoption. 5500 w. Engineering Magazine—Sept., 1909. No. 7415 B.

Electric Traction on Steam Railroads. Edwin B. Katte. From a lecture delivered at Harvard University. Remarks on the advantages of electric operation, the systems commonly used, and the electrification recently installed on the N. Y. C. & H. R. R. R. 3000 w. Sib Jour of Engng—Dec., 1908. No. 1351 C.

Some Phases of Steam-Railroad Electrification in the United States. Edward N. Lake. A study of progress and discussion of the outlook. 4000 w. Engineering Magazine—July, 1909. No. 5970 B.

Notes Taken During a Journey of Enquiry in the United States. Em. Uytborck. Principally an illustrated description of the electrification of the N. Y. C. & H. R. and the N. Y., N. H. & H. lines and their equipment, with criticism and comparison. 21500 w. Bul Int Ry Cong—Nov., 1908. No. 896 G.

The Choice of a System of Electrification for Trunk Lines. C. L. de Muralt. Discusses only lines now operated by steam, investigating the merits of the four electric systems and comparing them. Discussion. 5400 w. Pro Am Inst of Elec Engrs—Sept., 1909. No. 8148 F.

Railway Electrification. N. W. Storer. Abstract of a lecture on reasons why railways should be electrified. 1200 w. Sib Jour of Engng—June, 1909. No. 5809 C.

Some Notes on Railroad Electrification Matters. C. L. de Muralt. An explanation of the differences in continuous current, single phase and three phase systems. 2000 w. Mich Tech—Feb., 1909. No. 4069 D.

The Approaching Transfer of the Electrification Problem. General discussion. 12500 w. Pro N Y R R Club—March 19, 1909. No. 3933.

Developments in Electrification of Railway Terminals. H. H. Evans. A discussion of the advantages, the economies gained and the factors that lead to electrification. General discussion. 30000 w. Jour W Soc of Engrs—April, 1909. No. 4787 D.

The Difficulties of Underground Transmission for Trunk Line Electrification. William A. Delmar. An examination of construction and operation difficulties in underground transmission. 1500 w. Elec Age—June, 1909. No. 6131.

Railway Electrification. Philip Dawson. Briefly considers a few advantages in the case of long-distance lines, especially discussing the advantages to British railways by the electrification of suburban lines. 3000 w. Elec Rev, Lond—Feb. 5, 1909. Serial, 1st part. No. 2476 A.

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Electrification

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Freight Cars

Electric Traction on Urban and Inter-urban Steam Railways. H. E. O'Brien. Abstract from Pro. of Liverpool Engng. Soc. Discusses the value of electrification, summing up against electric traction on main lines. 2000 w. *Elect'n, Lond*—Jan. 22, 1909. No. 2208 A.

Inaugural Address to the Leeds Local Section of the Institution of Electrical Engineers. H. E. Yerbury. (Abstract.) Reviews the progress made in the electrification of tramways and railways, discussing probable future developments. 1200 w. *Elect'n, Lond*—Nov. 6, 1908. No. 312 A.

The Electrification of Railways.—A General Comparison of Systems. F. W. Carter. Read before the Rugby Engng. Soc. Compares in a general way the merits and demerits of the various systems of operation, showing that no one system satisfies all needs, and indicates the class of work to which each is suited. 3000 w. *Elect'n, Lond*—Feb. 26, 1909. No. 3051 A.

Presidential Address before the Institution of Mechanical Engineers. John A. F. Aspinwall. A general discussion of the electrification of steam railways. Ills. 11000 w. *Inst of Mech Engrs*—April 23, 1909. No. 4558 N.

The Introduction of Electric Traction on Main-Line Railways. E. Frischmuth. Report of a paper read before the Elektrotechnische Verein. Discusses the advantages, working, maintenance, system, etc. Ills. 11500 w. *Bul Int Ry Cong*—Aug., 1909. No. 8030 G.

Electrification of the State Railways of Italy. Extracts from information supplied by the general director of the State Railways of Italy. Maps. 3000 w. *Engr, Lond*—April 16, 1909. No. 4304 A.

Electric-Traction Studies in Switzerland (Gli Studi per la Trazione elettrica in Svizzera). Emilio Gerli. A résumé of the results of recent extended investigations. Serial, 1st part. 3500 w. *Ing Ferro*—June 1, 1909. No. 6556 D.

Report of the Swiss Commission on Electrification (Mitteilungen der Schweizerischen Studienkommission für elektrischen Bahnbetrieb). W. Wyssling. Results of an investigation of the possibilities of electric traction on Swiss railways. Ills. Serial, 1st part. 3000 w. *Schweiz Bau*—Oct. 17, 1908. No. 561 B.

The Proposed Change to Electric Traction at the Chicago Terminal of the Illinois Central R. R. From a report by a special committee in connection with smoke abatement. Outlines the present

situation, and discusses questions relating to the electrification. 2500 w. *Eng News*—Dec. 24, 1908. No. 1238.

A Proposal to Force the Railways Entering Chicago to Adopt Electricity. Editorial on the unreasonableness of the demand. 1000 w. *Eng News*—Oct. 7, 1909. No. 8407.

New York Central Railway Electrification. Brief illustrated description of the conversion of a part of this steam railway to electric traction on the continuous current system. 3000 w. *Tram & Ry Wld*—Jan. 7, 1909. No. 2057 B.

The Log of the New Haven Electrification. W. S. Murray. Aims to bring the actual operation of the New Haven single-phase electrification as closely as possible to those interested in its merits and faults. Ills. 10000 w. *Pro Am Inst of Elec Engrs*—Dec., 1908. No. 841 F.

Discussion on "The Log of the New Haven Electrification." New York, Dec. 11, 1908. 27000 w. *Pro Am Inst of Elec Engrs*—May, 1909. No. 4994 F.

Proposed Electrification of Part of the Grand Trunk Pacific. Editorial on the proposal to electrify the portion of the line between the St. Lawrence River and Moncton, New Brunswick. 1000 w. *R R Age Gaz*—April 30, 1909. No. 4364.

The Electrification of the Heysham, Morecombe and Lancaster Branch of the Midland Railway. Em. Uytborck. Describes the various installations, calling attention to the special peculiarities. Ills. 5800 w. *Bul Int Ry Cong*—April, 1909. No. 4981 G.

The Electrification of the South London Line of the London, Brighton & South Coast Railway. Brief illustrated account of work in progress in England, and the equipment adopted. 1500 w. *R R Age Gaz*—Aug. 6, 1909. No. 6924.

See also Trunk Lines, under STREET AND ELECTRIC RAILWAYS.

Freight Cars.

A General Service Freight Equipment Car. Detailed description of a car of the convertible type. Ills. 900 w. *Am Engr & R R Jour*—Nov., 1908. No. 91 C.

Standard Fifty-Ton Gondola Coal Car. Illustrated detailed description of cars for the Virginian Railway. 1200 w. *Am Engr & R R Jour*—Nov., 1908. No. 88 C.

Fifty-Ton Steel Gondola Car. Illustrated detailed description of a car for the Virginian railway. 500 w. *Am Engr & R R Jour*—Oct., 1909. No. 8303 C.

Fifty Ton Steel Gondola Car. Drawings and description of cars for the Nor-

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folk & Western Ry. 500 w. Am Engr & R R Jour—Sept., 1909. No. 7574 C.

General Service Steel Gondola Cars. Description of new steel cars with doors to permit of gravity dumping. Over 99 per cent. of the loading can be discharged by gravity in the latest type of cars. Ills. 600 w. Am Engr & R R Jour—June, 1909. No. 5339 C.

Summers Ore Car for the Duluth & Iron Range. Illustrated description of a self-clearing car. 600 w. R R Age Gaz—Jan. 29, 1909. No. 2145.

Four-Hopper Steel Coke Car. Illustrated description of a new design for the Pennsylvania R. R. 800 w. Am Engr & R R Jour—May, 1909. No. 4421 C.

Steel Car for Carrying Plate Glass. Description and drawings of a new car for the Pittsburgh Plate Glass Co. Ills. 500 w. Am Engr & R R Jour—June, 1909. No. 5331 C.

Fruit and Vegetable Cars for the San Antonio & Aransas Pass. Illustrated description of cars containing new features in the ventilating arrangements. 400 w. R R Age Gaz—Jan. 29, 1909. No. 2144.

The Construction of Large Railway Wagons. From the presidential address of Jas. Hewlett before the Midland Jun. Gas Engng. Assn. Compares flat and hopper wagons, and ten and twenty-ton wagons. 2500 w. Ir & Coal Trds Rev—Oct 30, 1908. No. 202 A.

Large Railway Wagons. From the presidential address of Jas. Hewitt, at meeting of the Jun. Gas Engng. Assn. Deals with the construction of large railway wagons and their use at gas-works. 2500 w. Col Guard—Nov. 20, 1908. No. 737 A.

21-Ton Self-Discharging Wagon. Brief illustrated description of cars for service on the Burma Railways. 400 w. Engr, Lond—Sept. 10, 1909. No. 7870 A.

Fuel Accounting.

Best Method of Accounting for Railway Fuel. Extracts from report of committee before the Int. Ry. Fuel Assn. 3000 w. Ry & Engng Rev—June 26, 1909. No. 6014.

Lifting Jacks.

Mechanical Lifting of Railway Rolling Stock (Note sur le Levage mécanique des Véhicules de Chemins de Fer et notamment des Voitures à Bogies). M. Oudet. Describes compressed air, hydraulic, and electric apparatus for lifting cars from their trucks. Ills. Plates. 3300 w. Rev Gen des Chemins de Fer—Dec., 1908. No. 1914 G.

MOTIVE POWER AND EQUIPMENT.

Locomotive Boilers

Locomotive Ashpans.

The Locomotive Ashpan Situation. Editorial on the ashpans used on American locomotives, describing the self-dumping types. 1500 w. R R Age Gaz—Aug. 27, 1909. No. 7397.

Self Clearing Ash Pans. Discusses the leading types of ash pans which fulfil the requirements of the ash-pan law in effect on Jan. 1, 1910, for railways engaged in interstate or foreign traffic. Ills. 2600 w. Am Engr & R R Jour—June, 1909. No. 5337 C.

Locomotive Ash Pan Attachment. Describes an improved ash pan invented by T. W. Anderson, where warping does not interfere with the dumping mechanism. Ills. 1100 w. Ry & Engng Rev—June 5, 1909. No. 5373.

Locomotive Axle Loads.

Distribution of Locomotive Axle-Loads, in Relation to Bridges. James Dudley Ward Ball. Compares different engines of various types to ascertain which produces a minimum bending moment. Diagrams. 2500 w. Inst of Civ Engrs—No. 3816. No. 8168 N.

Locomotive Boilers.

Government Supervision and Inspection of Locomotive Boilers. A critical discussion of bill No. 236, introduced in the United States Senate on March 22, with editorial. 5000 w. R R Age Gaz—June 11, 1909. No. 5469.

Locomotive Boiler Inspection. Information from the second annual report of the New York Public Service Commission concerning work done. 3000 w. Boiler Maker—Feb., 1909. No. 2320.

Circulation in Locomotive Boilers. Roger Atkinson. A description of the movement set up by heat and the arrangements that have been tried to improve it. 1800 w. Ry & Loc Engng—May, 1909. No. 4419 C.

Regulating Valves for Locomotive Boilers. Describes an improved design recently patented in England. Ills. 700 w. Mech Engr—Jan. 1, 1909. No. 1510 A.

The Relation of the Brick Arch to the Efficiency of the Present Day Locomotive Boiler. George Wagstaff. Explains the advantages of the brick arch, considering its disadvantages have been largely overcome. General discussion. 7000 w. Pro Cent Ry Club—Nov. 13, 1908. No. 1298 C.

Combustion and Heat Absorption in Locomotive Boilers. Lawford H. Fry. A study based on the tests carried out by the Pennsylvania Railroad Company. 4500 w.

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Locomotive Design

Engng—Feb. 19, 1909. Serial. 1st part. No. 2892 A.

Advisability of Installing Hot-Water Washouts and Filling Systems Luther H. Bryan. Read before the Int. Ry. Gen. Foremen's Assn. Presents the advantages of the hot-water system. 1200 w. Boiler Maker—July, 1909. No. 6188.

Comparative Tests of Water Tube and Standard Fireboxes. S. S. Riegel. Describes tests of 1-in. scale models in which a large gain in the amount of water evaporated by the water tube boiler designed by the author was shown. Ills. 1400 w. Am Engr & R R Jour—June, 1909. No. 5340 C.

Economy in Boiler Washing. Illustrates and describes the National Boiler Washing System in use on the A. T. & S. F. Ry., explaining its value. 1500 w. Ry & Engng Rev—June 19, 1909. No. 5670.

Boiler Check Valves and Feed Water Delivery Pipes. Extracts from a paper by J. D. Emerson, read before the Traveling Engrs.' Assn. 1400 w. Ry & Engng Rev—Sept. 11, 1909. No. 7616.

Improvements in Locomotive Boilers. Mr. Nadal. Report for Belgium, Spain, France, Italy, and Portugal. 12500 w. Bul Int Ry Cong—July, 1909. No. 8022 G.

The Brotan Locomotive Boiler. Illustrated description of a new engine without copper plates and braces. 1500 w. Sci Am Sup—Dec. 19, 1908. No. 1235.

The Modern Locomotive Boiler. John W. Hobson. Read before the Graduate Sec. of the N.-E. Coast Inst. of Engrs & Shipbldrs. Introductory remarks with consideration of questions of design. Ills. 3500 w. Mech Engr—Sept. 17, 1909. Serial. 1st part. No. 8119 A.

The Modern Locomotive Boiler. John W. Hobson. Considers questions of design and construction. Plates. 9000 w. Trans N-E Coast Inst of Engrs & Shipbldrs—Sept., 1909. No. 8502 N.

Locomotive Brakes.

The Pressure on Locomotive Brake Blocks. Considers methods of estimating the pressure. Diagrams. 2000 w. Engr, Lond—July 9, 1909. No. 6427 A.

Locomotive Cleaning.

Scouring Plant in the Saarbrücken Shops (Auskochanlage in der Hauptwerkstätte Saarbrücken). Herr Halfmann. Illustrated description of a successful plant for cleaning locomotive parts by steam, with costs 2500 w. Glasers Ann—Dec. 15, 1908. No. 1971 D.

Locomotive Construction.

Comparison of Locomotive Building in the United States, Germany and France. Marcel Bloch. Trans. from *Rev. Gen. des Chem. de Fer*. Investigates the causes that justify the difference in price and delivery. 2500 w. R R Age Gaz—June 11, 1909. Serial. 1st part. No. 5470

The Conditions of Locomotive Building in the United States, Germany and France (Note sur les Conditions de Construction des Locomotives aux Etats-Unis, en Allemagne et en France). Marcel Bloch. A comparison of conditions for rapid and cheap locomotive building. 15000 w. Rev Gen d Chemins de Fer—April, 1909. No. 4822 G.

Locomotive Construction in the United States, Germany and France (Note sur la Construction des Locomotives aux Etats-Unis, en Allemagne et en France). Louis Le Chatelier. A criticism of M. Marcel Bloch's paper on this subject. 2000 w. Rev Gen des Chemins de Fer—June, 1909. No. 6531 G.

Locomotive Counterbalancing.

Locomotive Counterbalancing. H. H. Vaughan. Read before the Can. Ry. Club. A discussion of the theoretical principles underlying counterbalancing. 4500 w. Am Engr & R R Jour—Oct., 1909. No. 8304 C.

Locomotive Crank Axles.

Tests of Frémont-Type Crank Axles (Essais d'Essieux condés à Flasques évidées). E. Hallard. The results of tests on the Chemin de Fer du Midi show that the form of crank devised by M. Frémont is an improvement over that commonly used. Ills. 1500 w. Rev Gen des Chemins de Fer—Dec., 1908. No. 1913 G.

Locomotive Design.

Design of Oil Burning Locomotives. Harrington Emerson. Presents a comparison between the limitations of coal burning and oil burning locomotives, and the effect on design. 1000 w. Am Engr & R R Jour—Jan., 1909. No. 1592 C.

Weight Distribution of Mallet Articulated Locomotives. H. M. Sloat. Explains method of calculating the weight distribution. 1000 w. Am Engr & R R Jour—Feb., 1909. No. 2238 C.

A Diagram for Determining the Relation Between Cylinder Power and Heating Surface. Lawford H. Fry. Gives diagram and explanation. 500 w. Am Engr & R R Jour—Sept., 1909. No. 7573 C.

The Efficiency of Locomotives and Its Relation with Their Chief Dimensions and the Speed. Albert Frank, in *Ann.*

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Locomotive Design

für Gewerbe und Bauwesen. Gives calculations of value in designing locomotives for special purposes. 9800 w. Bul Int Ry Cong—Oct., 1908. No. 170 G.

Design of a Four-Cylinder Compound Locomotive (*Calcul d'une Locomotive Compound à Quatre Cylindres*). Marcel Ubaghs. Illustrated description of the method of obtaining the principal dimensions. 3500 w. All Indus—Oct., 1908. No. 527 D.

Locomotive Dynamometers.

Ashton Locomotive Recording Dynamometer. Illustrated detailed description of an invention of S. T. Parks, explaining its value. 1500 w. R R Age Gaz—Aug. 27, 1909. No. 7398.

Locomotive Economy.

Locomotive Characteristics. Lawford H. Fry. Gives chart for the operation of single expansion locomotives, with explanatory notes. 1800 w. Am. Engr & R R Jour—Nov., 1908. No. 89 C.

Fuel Economy. Extracts from a paper by S. D. Wright read before the Traveling Engrs.' Assn. Considers fuel-saving devices, waste coal, boilers and their care, etc. 4000 w. Ry & Engng Rev—Sept. 11, 1909. No. 7717.

Steam Consumption of Locomotives (*Dampfverbrauch der Lokomotiven*). Herr Obergethmann. Discusses the various factors affecting it, gives results of tests, etc. 8300 w. Glasers Ann—May 15, 1909. No. 5785 D.

Locomotive Efficiency.

See Train Speed, under MOTIVE POWER AND EQUIPMENT.

Locomotive Explosions.

The Locomotive Explosion at Cardiff Docks. Gives the Board of Trade investigation into the cause of this disaster. Ills. 5500 w. Mech Engr—Aug. 13, 1909. No. 7322 A.

Locomotive Failures.

Locomotive Failures with Walschaert Valve Gear. Extracts from a report to the Traveling Engrs.' Assn. Outlines steps to be taken in case of a failure of any part while on the road. 1800 w. Ry & Engng Rev—Sept. 11, 1909. No. 7615.

Locomotive Feed Water.

A Large Water Softener. Illustrates and describes a plant designed to deal with 30,000 gals per hour. 1200 w. Engr, Lond—Dec. 11, 1908. No. 1223 A.

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Locomotive Frames

Locomotive Fireboxes.

Jacobs-Shupert Locomotive Fire Box. H. W. Jacobs. Illustrated description of a new design which is being applied to the "Santa Fe type" engine, and to the new passenger Mallet type engines. 2500 w. Am Engr & R R Jour—March, 1909. No. 2964 C.

Jacobs-Schupert Locomotive Firebox. H. W. Jacobs. Illustrated description of construction, with explanation of advantages. 2500 w. Boiler Maker—April, 1909. No. 3830.

The Jacobs-Shupert Locomotive Firebox. Illustrated detailed description of a radical departure from the usual construction. Also editorial. 3000 w. R R Age Gaz—May 28, 1909. No. 5047.

A Locomotive Firebox Without Staybolts in the Side Sheets and Crown Sheet. Illustrated description of the Jacobs-Shupert system, Atchison, Topeka & Santa Fe Ry. Also editorial. 3500 w. Eng News—June 17, 1909. No. 5579.

The Life of Side Sheets of Wide Fireboxes. C. A. Seley. Discusses their design. General discussion. Ills. 13000 w Pro W Ry Club—Dec. 15, 1908. No. 1797 C.

A New Departure in Flexible Stay Bolts. H. V. Wille. Proposes the use of high carbon spring steel and to increase the unit tensile stress. Ills. 1200 w. Jour Am Soc of Mech Engrs—Jan., 1909. No. 1851 F.

A New Departure in Flexible Staybolts. Discussion of H. V. Wille's paper on this subject. Ills. 2500 w. Jour Am Soc of Mech Engrs—Oct., 1909. No. 8533 F.

Locomotive Flues.

Endurance of Locomotive Flue Material. Alex. Kearney. From the address before the Richmond Ry. Club. A report of investigations of this material and the causes of its deterioration. Ills. 3500 w. Ry & Engng Rev—Nov. 28, 1908. No. 702.

Endurance of Flue Material in Locomotives. Alexander Kearney. Read before the Richmond R. R. Club. Considers the method of application, the composition and the changes which affect its endurance under service conditions. 1700 w. Boiler Maker—Jan., 1909. No. 1665.

See also Shops, under MOTIVE POWER AND EQUIPMENT.

Locomotive Frames.

Frame Failures on Modern Locomotives. F. P. Roesch. Discusses the causes and the remedy. 3000 w. Ry & Loc Engng—Dec., 1908. No. 798 C.

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Locomotive Fuels

MOTIVE POWER AND EQUIPMENT. Locomotive Performances

Frame Failures. C. G. Rommel. Discusses points relating to such failures and the repairs. 1500 w. R R Age Gaz—Dec. 4, 1908. No. 807.

Locomotive Fuels.

Fuel Economy in Six Propositions. W. B. Landon. States the propositions, discussing each, and gives a number of chemical analyses. Relates to fuel for railways. 2500 w. Ry & Engng Rev—April 3, 1909. No. 3747.

The Purchase of Railway Fuel Coal. Eugene McAuliffe. A short paper introducing a discussion of this subject. 13500 w. Pro W Ry Club—Jan. 19, 1909. No. 2714 C.

Tests of Briquetted Fuel on Locomotives. Reports the tests made by the U. S. Geol. Survey. Ills. 3000 w. Ry & Engng Rev—Jan. 30, 1909. No. 2183.

Briquetting Tests at the United States Fuel-Testing Plant, Norfolk, Virginia, 1907-8. Charles L. Wright. Illustrated description of the U. S. Geol. Survey plant at Norfolk, and its equipment, with report of tests. 8000 w. U S Geol Survey—Bul. 385. No. 5856 N.

Coal Briquettes for Locomotive Fuel. Review of a paper by C. T. Malcolmson, read at a meeting of the Int. Ry. Fuel Assn., giving the history of coal briquetting and information related. 2500 w. Eng News—Aug. 5, 1909. No. 6912.

Sub-Bituminous or Lignite Coal as Fuel for Locomotives. E. W. Fitt. Describes deposits in Wyoming and Colorado, giving average analyses, and some of the objections to their use on locomotives, and a short description of front-end arrangements that are in use. Ills. 2500 w. Am Engr & R R Jour—Oct., 1909. No. 8302 C.

Formation of Coal, Combustion; Economical Methods of Handling and Firing Bituminous Coal for Locomotive Use. C. F. Smith. Also discussion. 4000 w. Pro St Louis Ry Club—Sept. 17, 1909. No. 8521.

Tests of Lloydell Coal and Briquets on the Locomotive Testing Plant at Altoona. Abridged report of results, prepared by E. D. Nelson. 2800 w. R R Age Gaz—Feb. 5, 1909. No. 2300.

Influence of Ash on Value of Coal in Locomotive Service. A. Bement. A brief report of experiments, introducing a discussion of this subject. 4000 w. Pro W Ry Club—April 20, 1909. No. 4757 C.

Petroleum Residues as Fuel on the Roumanian Railways. Information concerning this fuel and the method of burning it. 2000 w. Engr, Lond—Dec. 25, 1908. No. 1542 A.

Installations and Apparatus used on Roumanian Railways for Firing Locomotive Boilers with Petroleum Residues (Description des Installations et des Appareils en Usage aux Chemins de Fer de l'Etat Roumain pour l'Emploi des Résidus de Pétrole au Chauffage des Locomotives). Th. Dragen. Detailed description. Ills. 8500 w. Rev Gen des Chemins de Fer—Dec., 1908. No. 1915 G.

Burning Heavy Residuum Oils in the Locomotives of the Roumanian State Railways (Le Chauffage au Huiles lourdes de Pétrole des Locomotives des Chemins de Fer De l'Etat roumain). Illustrated description of the fire box, etc. 2000 w. Génie Civil—Feb. 6, 1909. No. 3338 D.

The Employment of Liquid Fuels on Locomotives (L'Impiego del Combustibile liquido sulle Locomotive). Giulio Pasquali. The first part begins a description and discussion of burners. Ills. Serial, 1st part. 1000 w. Ing Ferro—March 16, 1909. No. 4246 D.

Locomotive Life.

On the Serviceable Life and Average Annual Cost of Locomotives in Great Britain. Richard Price Williams. Deals with the locomotive stock of 15 of the principal railways in Great Britain. Tables and diagrams. 4500 w. Inst of Civ Engrs—No. 3766. No. 6449 N.

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Locomotive Performances MOTIVE POWER AND EQUIPMENT.

Locomotives

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The Work of Superheater and Compound Locomotives. Charles R. King. Gives charts showing the power capacity of such engines for comparison, with a study of the results shown. 3500 w. Engr, Lond—Dec. 25, 1908. No. 1540 A.

Great Western Six-Coupled Express Locomotive Work. An account of work done by these engines which have proved very satisfactory. 4500 w. Engr, Lond—Dec. 4, 1908. No. 1023 A.

Some Recent Locomotive Performances on the Northern Railway of France. J. T. Burton-Alexander. Gives results of personal observations of results obtained with 4-6-0 passenger engines. 3000 w. Engr, Lond—Oct. 8, 1909. No. 8938 A.

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High Steam Pressure in Locomotive Service. W. F. M. Goss. A review of a report to the Carnegie Institution of Washington. Describes the research and the means employed. 10500 w. Univ of Ill, Bul 26—Sept. 1, 1908. No. 2417 N.

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Tonnage Rating and Efficiency. A. W. Vestal. A discussion of the influences that must be considered in determining the most efficient rating of engines. 1600 w. Ry & Loc Engng—May, 1909. No. 4417 C.

Locomotive Repairs.

Locomotive Repair Shop Practice. Ethan Viall. Illustrates and describes methods used in the Chicago shops of the C. & N. W. Ry. 3300 w. Mach, N Y—May, 1909. No. 4424 C.

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Repairs to Locomotives by Contract Shops. Discusses questions relating to economy and the kind of repairs that could be adapted to outside repair arrangement. 3500 w. R R Age Gaz—Sept. 3, 1909. No. 7585.

A Firebox Patch. J. P. Morrison. Read before the Int. Ry. Gen. Foremen's Assn. Describes work requiring great care, giving itemized account of cost. 2000 w. Boiler Maker—July, 1909. No. 6189.

Locomotives.

Details of DeGlehn Compound Locomotives. Drawings and description of

the cylinders and of a novel boiler fitted to these locomotives. 1400 w. Am Engr & R R Jour—Nov., 1908. No. 90 C.

New Standardized Locomotives, Harriman Lines. Illustrates and describes types, giving specifications for the mogul type. 1500 w. Ry & Engng Rev—Oct. 31, 1908. No. 40.

Goods Locomotive for the Caledonia Railway. View, outline, sketch, and description of a new engine. 500 w. Engng—Oct. 23, 1908. No. 77 A.

Mogul for the Iowa Central. Illustration, with description of a 2-6-0 type for freight service. 700 w. Ry & Loc Engng—Nov., 1908. No. 8 C.

Ten-Wheeler for the Lackawanna. Illustration and description of recent engines for passenger service, weighing 217000 lbs. 900 w. Ry & Loc Engng—Nov., 1908. No. 11 C.

"Pacific" Type Compound Locomotive for the Paris-Orleans Railway. Illustrated detailed description of a 4-6-2 type of engine. 600 w. Engr, Lond—Oct. 30, 1908. No. 200 A.

Mallet Articulated Compound Locomotives for Santo Domingo. Illustrated detailed description. 700 w. R R Age Gaz—Nov. 27, 1908. No. 630.

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Articulated Compound Locomotives. C. J. Mellin. An illustrated study of the design and construction of engines of the Mallet articulated type, with related information. 6000 w. Jour Am Soc of Mech Engrs—Dec., 1908. No. 838 F.

Locomotives for the A. T. & S. F. Describes engines comprising a recently completed order, illustrating the Pacific (4-6-2) engine. 1000 w. Ry & Loc Engng—Dec., 1908. No. 797 C.

Engines for the Associated Lines. Information concerning the engines for the Harriman Lines, illustrating and describing the 4-4-2 engine for the Sonora Ry., and the 2-6-0 engine for the Cananea Yaqui River & Pacific. 1500 w. Ry & Loc Engng—Dec., 1908. No. 793 C.

Four-Cylinder Compound Locomotive, Hungarian State Railways. Illustrated detailed description of the Atlantic type balanced compound express engine, adopted as the standard type. 2000 w. Engr, Lond—Nov. 27, 1908. No. 870 A.

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Six-Coupled Locomotive for the North Brabant Railway. Illustration with particulars. 200 w. Engng—Nov. 27, 1908. No. 866 A.

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The Locomotives of the Gotthard Railway (Die Lokomotiven der Gotthardbahn). M. Richter. A historical study. Ills. Serial. 1st part. 5500 w. Zeitschr d Ver Deutscher Ing—Nov. 14, 1908. No. 1190 D.

Standard Atlantic and Mogul Locomotives for the Harriman Lines. Illustrated descriptions, with explanatory remarks. 1500 w. R R Age Gaz—Jan. 1, 1909. No. 1463.

Locomotives of the Pacific Type of the French Western Railway. Robert Dubois. Gives the proposed specification and an illustrated description of the engines. 2000 w. Bul. Int Ry Cong—Dec., 1908. No. 2006 G.

Compound Goods Locomotive, 0-10-0 Type, Servian State Railways. Illustration, with brief description. 500 w. Mech Engr—Jan. 1, 1909. No. 1509 A.

Twelve-Wheeled Duplex Tank Locomotive; Nitrate Railways Co., Chili. Illustrates and describes tank-engines of unusual size, weight, and power. 1500 w. Engng—Jan. 1, 1909. No. 1708 A.

Schmidt Superheater Locomotives Outside of Germany (Die Heissdampflokomotive, Bauart Schmidt, im Auslande). C. Guillery. Reviews their use in other European countries. Ills. 6000 w. Zeitschr d Ver Deutscher Ing—Dec. 5, 1908. No. 1999 D.

Mallet Compound Locomotive of the Hedjaz Railway (Locomotive compound Mallet du Chemin de Fer de l'Hedjaz, Arabia). Illustrated description with detailed drawing. 1000 w. Génie Civil—Dec. 5, 1908. No. 1927 D.

Horatio Allen and the Novelty Works. Edward P. Buffet. Sketch of the career of the man who brought the first locomotive to America. 3500 w. Power—Feb. 2, 1909. No. 2191.

Compound Atlantic Type Locomotives. C., M. & St. P. Ry. Illustrated detailed description of four-cylinder engines, with data regarding their work. 1200 w. Ry & Engng Rev—Feb. 13, 1909. No. 2454.

Balanced Compound Passenger Locomotive. Illustrated description of engines for the N., C. & St. L. Ry. 800 w.

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Articulated Compound Locomotive 0-6-6-0 Type. Illustrated description of a Mallet engine recently delivered to the D., N. W., & P. Ry. 600 w. Am Engr & R R Jour—Feb., 1909. No. 2240 C.

2-8-0 for the Lehigh and Hudson River. Illustrated description of consolidation type locomotives for use in heavy freight and coal traffic. 700 w. Ry & Loc Engng—Feb., 1909. No. 2265 C.

New Locomotive Equipment; East Indian Railway. Brief illustrated description of two types of heavy passenger locomotives. 500 w. R R Age Gaz—Feb. 19, 1909. No. 2547.

Compound Articulated Locomotive: Eastern Railway of France. Illustration, with description of large American built engines on the Mallet principle. 1500 w. Mech. Engr—Jan. 29, 1909. No. 2351 A.

A Compound for the Western of France (Locomotive-Tender compound des Chemins de Fer de l'Ouest). Description of a recent four-cylinder, six-wheel model. Ills. 3000 w. Tech Mod—Jan., 1909. No. 2635 D.

New Test Locomotives for the Swiss Railways (Neue Versuchslokomotiven der Schweizerischen Bundesbahnen). M. Weiss. Illustrated description of superheater locomotives of series A 3-5 and C 4-5. 2000 w. Schweiz Bau—Jan. 23, 1909. No. 2691 B.

Bodmer's Balanced Locomotives. Herbert T. Walker. Reproductions of original drawings, with description of designs of Bodmer, dating back to 1834. 3500 w. Engr, Lond—March 5, 1909. No. 3176 A.

Vauclain Compound Atlantic Type Locomotive. Illustrated description of engines for heavy passenger service on the C. M. & St. P. Ry. 800 w. Am Engr & R R Jour—March, 1909. No. 2965 C.

Mallet Articulated Compound Locomotives for France. Plate and illustrated description, with dimensions. 1000 w. Engr, Lond—March 19, 1909. No. 3672 A.

Freight Tank Locomotives for the Prussian State Railways. An editorial study of these engines, which are equipped with the Schmidt smoketube superheater, as examples of German practice, comparing with the practice in the United States. 2000 w. R R Age Gaz—March 5, 1909. No. 3030.

Ten-Coupled Mineral Locomotive; Swedish State Railways. Illustration and particulars of a recent type of engine for

handling the ore traffic. 200 w. Engng—March 19, 1909. No. 3619 A.

The New Types of Locomotives for the Italian State Railways (*I nuovi Tipi di Locomotive delle Ferrovie italiane di Stato*). Illustrated description with results of tests. Serial. 1st part. 3500 w. *Monit Tech*—Feb. 28, 1909. No. 3351 D.

Benjamin Hick's Locomotives. Herbert T. Walker. Illustrated descriptions of engines built during the years 1834-37. 1800 w. *R R Age Gaz*—April 2, 1909. No. 3740.

Mallet Articulated Compound Locomotives for the Southern Pacific Co. Illustrated detailed description, giving principal dimensions. 1500 w. *Ry & Engng Rev*—April 24, 1909. No. 4183.

Mallet Articulated Compound Locomotive for the Southern Pacific. Plate and illustrated detailed description of engines intended for operation on a grade of 116 ft. to the mile, and expected to haul 1212 tons back of the tender. 3000 w. *R R Age Gaz*—April 30, 1909. No. 4366.

Baldwin 213-Ton Articulated Locomotive for Southern Pacific Ry.; the Heaviest Locomotive Ever Built. Illustrated detailed description of recently completed freight engines of great weight and size to use on heavy grades. 3000 w. *Eng News*—April 29, 1909. No. 4362.

Mallet Compound Locomotive for the Mexican Central. Illustrated description with dimensions. 700 w. *R R Age Gaz*—April 9, 1909. No. 3848.

Four-Coupled Ten-Wheel Side-Tank Locomotive; Ballycastle Railway. Particulars and illustrated description of an engine for service in Ireland. Plate. 400 w. *Engng*—March 26, 1909. No. 3790 A.

New Locomotives for the Federated Malay Railways. Illustrated detailed description of metre gage Pacific locomotives. 1200 w. *R R Age Gaz*—April 2, 1909. No. 3738.

Heavy Passenger Locomotives of the 4.6:2 Class; Western Railway of France. Illustrated description, with dimensions. 1200 w. *Eng News*—April 29, 1909. No. 4356.

The Latest Locomotives of the Orleans Railway (*Note sur les dernières Locomotives puissantes de la Compagnie d'Orléans*). Th. Laurent. Illustrated detailed description of powerful Pacific, 4-cylinder compounds, with operating results. 5000 w. *Rev Gen des Chemins de Fer*—March, 1909. No. 4220 G.

A New Departure in Locomotive Construction. Illustrates a novel type of

steam locomotive using liquid fuel, constructed by Arthur Koppel for use on an industrial railway. 500 w. *Sci Am Sup*—May 29, 1909. No. 5026.

Pacific and Atlantic Type Locomotives. Illustrations, elevations, sections and description of engines for the Northern Pacific Ry. 1000 w. *Am Engr & R R Jour*—May, 1909. No. 4422 C.

4-6-0, for the Chicago, Milwaukee & Puget Sound Railway. Illustrated description of engines known as G-6, for handling the heaviest and fastest passenger trains. 1000 w. *Ry & Loc Engng*—May, 1909. No. 4418 C.

British Locomotive Building. From evidence of J. F. Robinson before the British Tariff Commission. Gives information in regard to the export trade, raw materials, standardization, etc. 4400 w. *R R Age Gaz*—May 7, 1909. No. 4559.

British Locomotives in 1908. J. F. Gairns. A review of the designs and performance. Ills. 7900 w. *Bul Int Ry Cong*—April, 1909. No. 4980 G.

Express Passenger Locomotives, North-Eastern Railway. Plate and dimensions of engines for heavy express traffic. 700 w. *Engr, Lond*—April 23, 1909. No. 4469 A.

Express Locomotive; Paris-Orleans Railway Company, France. Plate and illustrated detailed description of engines for fast express service in France, built in America. 2000 w. *Engng*—April 30, 1909. No. 4624 A.

The New 2/5 Coupled Express Locomotive of the Prussian State Railways (*Die neuen 2/5-gekuppelten Schnellzug-lokomotiven der Preussischen Staatsbahn*). Herr Metzeltin. Illustrated description. Serial. 1st part. 5000 w. *Zeitschr d Ver Deutscher Ing*—April 24, 1909. No. 5076 D.

Some Remarkable Locomotives of 1908. J. F. Gairns. An illustrated review of locomotive development during the year. 4500 w. *Cassier's Magazine*—June, 1909. No. 5539 B.

Articulated Compound Locomotives. Discussion of C. J. Mellin's paper. 6500 w. *Jour Am Soc of Mech Engrs*—June, 1909. No. 5846 F.

Details of Articulated Mallet Compound Locomotive. Describes in detail features of valves, reversing gear, and oil heater. Ills. 1400 w. *R R Age Gaz*—June 4, 1909. No. 5289.

Mallet Articulated Compound Locomotive for the Virginian Railway. Plate, and illustrated description of engines for handling traffic on steep grades. 2000 w. *R R Age Gaz*—June 18, 1909. No. 5614.

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New Locomotives for the St. Louis Southwestern Ry. Illustrates and describes types. 800 w. Ry & Engng Rev—June 19, 1909. No. 5669.

Consolidation and Pacific Type Locomotives for the Chicago and Alton Railroad. Description of 16 heavy freight locomotives supplied with Baker Pilliod valve gear and of 5 large Pacific locomotives similarly equipped. Ills. 3400 w. Ry & Engng Rev—June 5, 1909. No. 5367.

Consolidation Locomotive with New Design of Fire Tube Superheater. Describes one of a series of ten engines built for the Wabash Pittsburgh Terminal Railway. This locomotive carries 160 lbs. steam pressure and has 25-in. cylinders as against 200 lbs. and 22-in. cylinders for the other nine. Ills. 1000 w. Am Engr & R. R. Jour—June, 1909. No. 5341 C.

Heavy Consolidation for Wabash-Pittsburgh Terminal. Illustrated description of a recently built heavy 2-8-0 freight engine. 800 w. Ry & Loc Engng—June, 1909. No. 5233 C.

Mikado Type Freight Locomotive. Description of powerful freight locomotive of the 2-8-2 type for the Virginian Rwy. Ills. 1800 w. Am Engr & R. R. Jour—June, 1909. No. 5330 C.

Mikado Type Locomotives Built by C. M. & St. P. Ry. Illustrated detailed description. 1000 w. Ry & Engng Rev—May 29, 1909. No. 5168.

Compound Passenger Locomotive. Illustration and particulars of an engine for the Central Argentine Railway. 500 w. Engr, Lond—June 11, 1909. No. 5636 A.

Twelve-wheeled Duplex Tank Locomotive; Nitrate Railways Company, Chili. Plate and illustrated details. 500 w. Engng—May 21, 1909. No. 5195 A.

Two New French Locomotives. Illustrations and particulars of the 6-coupled express engine for Chemin de Fer du Nord, and the P. L. M. suburban and Riviera tank engine. 300 w. Engr, Lond—June 4, 1909. No. 5535 A.

The New Four-Cylinder Compound Locomotive with Three Coupled Axles, Series A 3-5, of the Gotthard Railway (Die neue Vierzylinder - Verbund - Lokomotive mit drei gekuppelten Achsen, Serie A 3-5, der Gotthardbahn). Illustrated description. Plate. 2000 w. Schweiz Bau—May 1, 1909. No. 5765 B.

The Earliest Balanced Locomotives. Herbert T. Walker. Illustrated description of the designs of John George Bodmer, in 1834, are given in the present num-

ber. 1500 w. R R Age Gaz—July 23, 1909. Serial, 1st part. No. 6631.

A Tabular Comparison of Notable Examples of Recent Locomotives Arranged in Order of Total Weights. 3000 w. Am Engr & R R Jour—July, 1909. No. 6190 C.

Mikado Locomotives for the Chicago, Milwaukee & Puget Sound. Illustrated description of a design for 20 recently completed locomotives. 500 w. R R Age Gaz—July 16, 1909. No. 6378.

Recent C. & A. Equipment. Illustrations, with descriptions, of locomotives for heavy freight and for fast passenger service. 1500 w. Ry & Loc Engng—July, 1909. No. 6118 C.

Consolidation Locomotives for the Pennsylvania. Illustrates and describes an example of Class H-8b, interesting on account of their weight, tractive power, and details of bracing. 500 w. R R Age Gaz—July 2, 1909. No. 6126.

Ten-Wheel Tank Locomotive (3-ft. 6-in. Gauge); Dutch Indian Railway. Illustrated detailed description of engines recently put in service in Java. Plate. 1200 w. Engng—June 18, 1909. No. 6042 A.

Four-Cylinder Pacific Compound of the Orleans Railway (Locomotives Pacific pagnie d'Orléans). Illustrated description. 3200 w. Génie Civil—June 19, 1909. No. 6548 D.

Locomotives Designed and Built at Horwich, with Some Results. George Hughes. Illustrated discussion of designs and performance of locomotives. 12000 w. Inst. of Mech Engrs—July, 1909. No. 6970 N.

Simple 4-4-0 for the Idaho Northern. Illustrated description of an engine equipped with a smoke-box superheater. 500 w. Ry & Loc Engng—Aug., 1909. No. 6870 C.

Eight-Wheel Switching Locomotives for the Virginian Ry. Illustration and description of heavy engines for switching in the yards. 1200 w. Ry & Engng Rev—Aug. 21, 1909. No. 7334.

Heavy 8-Wheel Switching Locomotive, D., L. & W. R. R. Illustrated description and dimensions of an engine for use in the Buffalo yards. 1200 w. Ry & Engng Rev—July 31, 1909. No. 6818.

Eight-Wheel Switching Locomotive. Illustration and dimensions of a very compact engine for the Western Railway of Havana. 500 w. Am Engr & R R Jour—Aug., 1909. No. 6802 C.

A Swiss Mountain Engine. Illustrations and brief notes concerning an ingenious engine used on the rack railway over the Brunig Pass. 250 w. Sci Am Sup—Aug. 7, 1909. No. 6961.

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Locomotive Scales

Ten-Wheel Locomotive for the Midi Railway of France. Abstract translation of an illustrated description by M. Bachellery, in the *Rev. Gen. de Chemin de Fer*. 1200 w. *Ry & Engng Rev*—Aug. 7, 1909. No. 6955.

Ten-Wheel Coupled Superheater Locomotives of the Midi Railway (Machines à Vapeur surchauffée à dix Roues accouplées de la Compagnie des Chemins de Fer du Midi). M. Bachellery. Illustrated description and report of tests. 4500 w. *Rev Gen d Chemins de Fer*—July, 1909. No. 7217 G.

Fireless Locomotives (Feuerlose Lokomotiven). L. Kempf. Describes and gives operating results of a German fireless switching locomotive. Ills. 3500 w. *Glaser's Ann*—July 1, 1909. No. 7299 D.

Simple v. Compound: A Footplate Experience. A comparison based on coal consumption, showing the compound to be superior. 3500 w. *Engr, Lond*—Aug. 20, 1909. No. 7485 A.

Ten-Wheel Locomotives for Brazil. Illustrates and describes two designs recently built. 1000 w. *Ry & Engng Rev*—Sept. 25, 1909. No. 8085.

Eight-Wheel Engines, Western Ry. of Havana. Illustrated description of engines equipped with fire tube superheater with side headers. 1000 w. *Ry & Engng Rev*—Sept. 4, 1909. No. 7551.

New Locomotives for the Natal Government Railway. Illustrations and description of engines remarkable for their size and power, and having many interesting features. 1500 w. *Mech Engr*—Sept. 17, 1909. No. 8116 A.

Locomotive History on the B. & M. W. A. Hazelboom. A brief sketch of the development of the locomotive on the Boston & Maine R. R. 2500 w. *Ry & Loc Engng*—Sept., 1909. No. 7581 C.

Minneapolis and St. Louis Engines. Illustrated brief descriptions of types. 800 w. *Ry & Loc Engng*—Sept., 1909. No. 7580 C.

Mallet Articulated Compound Locomotives, 2-6-6-0 Type, and Switching Locomotives 0-8-0 Type. Drawings and description of engines for the Virginian Railway. 2800 w. *Am Engr & R R Jour*—Sept., 1909. No. 7576 C.

A New American Articulated Locomotive (Eine neue amerikanische Gelenklokomotive). Bruno Schwarze. Describes a new Mallet compound for the Great Northern. Ills. 2500 w. *Glaser's Ann*—Aug. 1, 1909. No. 7979 D.

Creusot Water-Tube, Eight-Wheeled, Coupled, Compound Locomotive (Loco-

motive-Tender compound à Chaudière aquatubulaire et à huit Roues couplées, des Etablissements du Creusot). Illustrated description. Plate. 3000 w. *Génie Civil*—Aug. 28, 1909. No. 7940 D.

New Compound Six-Wheeled Coupled Locomotive of the Northern Railway of France (Nouvelle Locomotive compound à trois Essieux couplés et à Roues motrices de 1^m.75 de la Compagnie du Chemin de Fer du Nord). Illustrated description. 1200 w. *Rev Gen des Chemins de Fer*—Aug., 1909. No. 7923 G.

Machinery Exhibits at the Munich Exposition, 1908 (Die Maschinen auf der Ausstellung München 1908). G. Guillery. Devoted principally to the locomotive exhibits. Ills. 3000 w. *Glaser's Ann*—Aug. 1, 1909. No. 7979 D.

Latter-Day Developments of the American Locomotive. H. Keith Trask. This first of two articles discusses wheel arrangements and compounding and reviews locomotive development. 4000 w. *Engineering Magazine*—Nov., 1909. No. 8832 B.

Western Maryland Engines. Illustrates and describes a 4-6-2 passenger, and a Mallet articulated compound for work on grades of 3 per cent. and curves of 20 degs. 1000 w. *Ry & Loc Engng*—Oct., 1909. No. 8297 C.

Pacific Type Locomotive with Superheater. Illustrated description of 4-6-2 engines, using high degree superheated steam at 150 lbs. pressure, built for the Great Northern Ry. 1200 w. *Am Engr & R R Jour*—Oct., 1909. No. 8305 C.

Pacific Type Locomotives, C. P. R. Illustrated description of engines recently built for the Canadian Pacific Ry. 1200 w. *Ry & Engng Rev*—Oct. 23, 1909. No. 8776.

Superheated Steam Locomotives, San Paulo (Brazilian) Railway. Illustrated description of a 2-8-0, consolidation type locomotive with 6-wheel tender. 500 w. *Engr, Lond*—Oct. 8, 1909. No. 8940 A.

New Types of Locomotives on the Italian Railways (I nuovi Tipi di Locomotive-Tender delle Ferrovie Italiane). Plates and description of three recent types. 2500 w. *Ing Ferro*—Sept. 16, 1909. No. 8644 D.

Locomotive Scales.

Locomotive Weighing Machine, with Automatic Indicating Quadrants. Illustrations of an English built machine, with brief description. 300 w. *Engng*—Oct 15, 1909. No. 8897 A.

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Locomotive Smoke

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Locomotive Trucks

Locomotive Smoke.

Report of Chicago Smoke Inspection. Dept. on Abatement of Locomotive Smoke. From a bulletin issued by G. E. Ryder, giving facts based upon recent locomotive tests. Ills. 2000 w. Ry & Engng Rev—Nov. 28, 1908. No. 701.

The Smoke Nuisance in Cities. A. W. Gibbs. Shows the nature of the problem and the difficulties met in dealing with it, and reviews progress made in overcoming smoke from locomotives. 3500 w. R R Age Gaz—Feb. 26, 1909. No. 2777.

The Smoke Nuisance and the Railroads. A. W. Gibbs. Abstract of paper prepared for the Am. Civic Fed. Considers the subject from the economical and geological standpoint. 4000 w. Sci Am Sup—April 24, 1909. No. 4113.

Locomotive Speed.

See Speed, under ELECTRICAL ENGINEERING, MEASUREMENT; and Speed Indicators, under MECHANICAL ENGINEERING, AUTOMOBILES.

Locomotive Speed Recorders.

The Hasler Speed Recorder and Indicator. Illustrated description of a speed indicator and recorder for locomotives adopted on several continental railways. 1400 w. Engng—Feb. 5, 1909. No. 2487 A.

Locomotive Springs.

Locomotive Springs. J. A. Kinkad. Abstract of a paper before the Can. Ry. Club. Gives table issued by the Am. Loc. Co., and considers modulus, material, flexibility, testing and failures. 2500 w. R R Age Gaz—March 12, 1909. No. 3098.

Locomotive Springs. J. A. Kinkad. Abstract of paper read before the Can. R. R. Club. Gives tables issued by the Am. Loc. Co., and discusses the subject generally. 2500 w. Mech Engr—Oct. 15, 1909. No. 8882 A.

Locomotive Stokers.

Crawford's Mechanical Stoker for Locomotives. Illustrates and describes a design of an under-feed stoker and grate. 1200 w. Mech Engr—Aug. 6, 1909. No. 7093 A.

Mechanical Stokers. Editorial on the reports of the year 1909 of committees of the Master Mechanics' Assn. on mechanical stokers for locomotives. 1600 w. R R Age Gaz—Sept. 3, 1909. No. 7584.

Locomotive Superheaters.

Low, Moderately and Highly Superheated Steam. F. J. Cole. Discusses the advantages and economy of superheated steam in railway locomotives. 3200 w. Am Engr & R R Jour—June, 1909. No. 5329 C.

The Advantages of the Use of Moderately Superheated Steam in Locomotive Practice. Lawford H. Fry. Shows that so far as coal consumption is concerned, a low degree of superheat offers the same opportunity for economy as does a very high degree. 2500 w. R R Age Gaz—March 5, 1909. No. 3034.

Superheaters for Locomotives—Some Forgotten Applications (Cenni storici e descrittivi su Alcune antiche e sconosciute Applicazioni del Surriscaldamento alle Locomotive a Vapore). Charles R. King. Reprinted from *Ingegneria Ferroviaria*. Ills. 15000 w. Ing Ferro—1909. No. 7975 F.

The Application of Superheated Steam to Locomotives (Note sur l'Application de la Vapeur Surchauffée aux Locomotives). Maurice Demonlin. Deals with the results obtained on the Italian State Railways and the Western Railway of France. Ills. 10000 w. Rev Gen d Chemins d Fer—Oct., 1908. No. 521 G.

Locomotive Symbols.

Uniformity in the Symbols Used to Represent Different Types of Locomotives. P. Labryn. Gives explanation of systems used. 1000 w. Bul Int Ry Cong—May, 1909. No. 5685 G.

Locomotive Tenders.

Location of Side Bearings on Tender Trucks. Theodore H. Curtis. Discusses the proper design of locomotive tenders. Ills. 1150 w. Am Engr & R. R. Jour—June, 1909. No. 5334 C.

Tender for Six-Coupled Express Locomotive; Bengal-Nagpur Railway. Illustrated description with particulars of engine and tender. Plate. 500 w. Engng—March 5, 1909. No. 3167 A.

Locomotive Testing.

Combustion and Evaporation. Lawford H. Fry. Discussion of an analysis of the testing of locomotives at the St. Louis Exposition by Joseph Nodal in his book *Locomotives à Vapour*. 1650 w. Am Engr & R. R. Jour—June, 1909. No. 5332 C.

Locomotive Tests.

Indicator Tests and Starting Gear of the 2-5 Four-Cylinder Express Compound Locomotives of the Danish State Railway. O. Busse. Diagrams and observations recorded are discussed. Ills. 1700 w. Bul. Int Ry Cong—March, 1909. No. 3956 G.

See also Ergometer, under MECHANICAL ENGINEERING, MEASUREMENT.

Locomotive Trucks.

The Mechanics of the Locomotive Truck. L. S. Randolph. A discussion of

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Locomotive Valve Gears MOTIVE POWER AND EQUIPMENT.

Motor Cars

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Locomotive Valve Gears.

Valve Motion Design. Sidney C. Carpenter. Considers link motion design from the standpoint of the strain on the various parts. 1500 w. Ry & Loc Engng—March, 1909. No. 2940 C.

American Balanced Valves. Illustrates and describes two designs,—one is a flat slide and the other a piston valve. 1500 w. R R Age Gaz—May 21, 1909. No. 4799.

The Walschaert Valve Gear. C. O. Rogers. An illustrated explanation of the principles and construction. 3000 w. Sci Am Sup—March 27, 1909. No. 3584.

The Walschaerts Valve Gear as Applied to Locomotives. The present number deals with the general principles. 1200 w. Ry & Loc Engng—June, 1909. Serial. 1st part. No. 5235 C.

Setting Walschaert Valve Gear. R. S. Mounce. Rules for a specific case, but of general use. Diagrams. 900 w. Am Engr & R R Jour—Nov., 1908. No. 92 C.

Setting Valves on Locomotives with Walschaert Gear. Oscar Antz. Directions for laying out the gear on each locomotive. Diagrams. 1000 w. Am Engr & R R Jour—April, 1909. No. 3797 C.

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Young Rotary Valve and Gear for Locomotives. Illustrated detailed description of the recent improvements in this valve gear. 1000 w. R R Age Gaz—Nov. 13, 1908. No. 244.

Locomotive Wheels.

Flange Wear of Driving Tires. R. H. Rogers. Discusses the possible elimination of flange wears. Ills. 2000 w. Am Engr & R. R. Jour—June, 1909. No. 5338 C.

Flange Lubrication on Southern Pacific System. Illustrated description of

the flange lubricator with report of the results of its use. 700 w. R R Age Gaz—Jan. 15, 1909. No. 1792.

Mail Exchange.

The Burr Automatic Pneumatic Mail Exchange. Illustrated description of a device for the exchange of mail between stations and moving trains. 900 w. R R Age Gaz—Oct. 15, 1909. No. 8814.

Motor Cars.

A New Type of Gasoline-Electric Car. Illustrated description of a recent design of the General Electric Co. 1000 w. Elec Ry Jour—May 29, 1909. No. 5102.

New Stover Motor Car. Illustrated description of a 25-passenger gasoline motor car for the C., R. I., & P. Ry. 1000 w. Ry & Engng Rev—May 8, 1909. No. 4578.

Motor Section Cars on the C., M. & St. P. Ry. An illustrated account of the use of these cars, describing the details. Also editorial. 3000 w. Ry & Engng Rev—June 19, 1909. No. 5668.

The McKeen Motor Cars. Illustrated description of a combination passenger and baggage car driven by gasoline. 1000 w. R R Age Gaz—Jan. 14, 1909. No. 1791.

The Petrol-Electric System of Traction. Illustrates and describes this system of motor-car traction on the Continent, as installed by the Westinghouse Co. 2000 w. Tram & Ry Wld—July 8, 1909. No. 6606 B.

The Maffei Steam Motor Coach. Illustrated description of a motor car for the Bavarian state railroads, which shows novel features. 800 w. Sci Am Sup—May 15, 1909. No. 4639.

Railway Motor Car for Siam. Illustrations of this oil-engine car with brief description. 500 w. Engr, Lond—Dec. 4, 1908. No. 1025 A.

Traction by Petrol-Electric Motor Cars on the Arad-Csanad Railways, Hungary (La Traction par Automotrices pétrolés-électriques sur les Chemins de Fer d'Arad-Csanad, Hongrie). Illustrated description of the mechanical de-economic results. 3000 w. L'Elec—Dec. 19, 1908. No. 1922 D.

Accumulator Cars of the Prussian State Railways. An illustrated description of the electrical equipment of these cars. 2200 w. Tram & Ry Wld—Dec. 3, 1908. No. 1203 B.

Two-Class Accumulator Cars of the Prussian State Railways (Akkumulator-doppelwagen der preussischen Staatsbahn-Verwaltung). D. Hönsch. Illustrated de-

Motor Cars

MOTIVE POWER AND EQUIPMENT.

Refrigeration

scription of a car to accommodate 100 passengers. 3000 w. *Glaser's Ann*—Nov. 1, 1908. No. 1167 D.

The Accumulator Motor Cars of the Prussian State Railways (*Die Akkumulator-Doppelwagen der Preussischen Staatsbahn-Verwaltung*). Herrn Hönsch and W. Mattersdorff. Illustrated detailed description. 5000 w. *Zeitschr d Ver Deutscher Ing*—Feb. 6, 1909. No. 3560 D.

Accumulator Cars for the Prussian State Railways (*Akkumulator-Doppelwagen für die preussische Staatsbahnverwaltung*). H. Becker. A complete description. Ills. 3000 w. *Elek Kraft u Bahnen*—May 14, 1909. No. 5952 D.

Motor Car Traffic on the Prussian-Hessian State Railways (*Triebwagenverkehr auf den preussisch-hessischen Staatsbahnen*). Describes the work of the new accumulator cars. Ills. 2000 w. *Elek Kraft u Bahnen*—May 14, 1909. No. 5951 D.

Suburban Operation with Accumulator Motor Cars on the Prussian State Railways (*Vorortverkehr mit elektrischen Triebwagen auf den Preussischen Staatsbahnen*). Carl Vogel. Describes the cars, their equipment, and operating results. Ills. 4500 w. *Elek Kraft u Bahnen*—June 23, 1909. No. 6713 D.

One-Hundred Horse-Power Steam Motor Car of the Hannover Machine Company (100 pferdiger Dampftriebwagen der Hannoverschen Maschinenbau-A.-G. vormalis George Eggestorff). B. Buchholz. Illustrated description of car and machinery. 2000 w. *Zeitschr d Ver Deutscher Ing*—July 10, 1909. No. 7470 D.

Accumulator Cars of the Prussian State Railways (*Akkumulatoren Doppelwagen der Preussischen Staatsbahnen*). Illustrated description and details of performance. 2000 w. *Elektrotech Zeitschr*—Oct. 29, 1908. No. 615 B.

Accumulator Motor Cars of the Prussian State Railways (*Automotrices à Accumulateurs des Chemins de Fer de l'Etat prussien*). Illustrated detailed description. Plate. 2900 w. *Génie Civil*—Dec. 26, 1908. No. 1931 D.

Gasoline and Oil Engines for Railway Motor Cars (*Motore a Petrolio e ad Oli Pasanti, a Combustione senza Accensore, per Automotrici Ferroviarie, Moderabile, Invertibile e ad Azione Diretta sull' Asse del Veicolo*). Enrico Mariotti. Ills. Serial. 1st part. 3000 w. *Ing Ferro*—Oct. 16, 1908. No. 542 D.

Comparative Tests of Motor Cars and Light Locomotives (*Prove di Confronto fra Automotrici e Locomotive leggere*).

Reports trials made on Austrian railways. Ills. 2700 w. *Ing Ferro*—July 16, 1909. No. 7249 D.

See also Motors, under MECHANICAL ENGINEERING, AUTOMOBILES.

Operating Associations.

Railway Operating Associations. W. F. Allen. Address at Harvard Univ. Reviews the causes that led to their formation, and outlines their history. 15700 w. *Bul Int Ry Cong*—July, 1909. No. 8025 G.

Passenger Cars.

The Use of Steel in Passenger Car Construction. John McE. Ames. Discusses why steel should be used in passenger construction, and where, with related matters, cost, etc. General discussion. 8500 w. *Pro Cent Ry Club*—March 12, 1909. No. 4082 C.

All-Steel Suburban Cars. Brief illustrated description of cars for the Long Island R. R. 500 w. *Am Engr & R R Jour*—Jan., 1909. No. 1594 C.

Coach with Steel Underframes for the Central of New Jersey. Illustrated description. 500 w. *R R Age Gaz*—July 9, 1909. No. 6233.

New Passenger Equipment for the St. Paul. Illustrated description of the buffet library car, the construction of which is typical of all other cars recently built. 1200 w. *R R Age Gaz*—Oct. 1, 1909. No. 8246.

New Types of Broad Gauge Underframes and Bogies. Illustrated descriptions of types for the Indian State Railways. 1000 w. *Engr, Lond*—Nov. 20, 1908. No. 745 A.

The Queen's New Saloon. Illustrated description of a new Royal car for the North-Eastern Railway. 1200 w. *Engr, Lond*—March 26, 1909. No. 3793 A.

Refrigeration.

Improvements in Refrigerator Cars. Joseph H. Hart. An explanation of the more important improvements recently introduced to increase the efficiency in the transportation of perishable products. 2500 w. *R R Age Gaz*—Aug. 6, 1909. No. 6920.

Mechanical Refrigeration in Railway Transportation. Joseph Hart. A discussion of view of the railway, and from a sion of the present situation from the refrigerating viewpoint. 4000 w. *R R Age Gaz*—April 2, 1909. No. 3741.

A Movable Refrigerating Plant for Pre-Cooling. S. J. Dennis. Read before the Am. Soc. of Refrig. Engrs. An illustrated description of the refrigerating car. 1500 w. *Cold Storage & Ice*—Dec., 1908. No. 993 C.

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Repair Card

MOTIVE POWER AND EQUIPMENT.

Shops

The Transportation of Perishable Freight in Refrigerator Cars (Le Transport des Denrées Alimentaires par Wagons Frigorifiques). L. Piaud. Describes recent French practice. Ills. 3000 w. Génie Civil—Oct. 3, 1908. No. 533 D.

Repair Card.

Abuse of the M. C. B. Repair Card. A general discussion. 3000 w. Pro N Y R R Club—March 19, 1909. No. 3932.

Sanding Devices.

A Locomotive Sanding Device (Un Appareil pour le Sablage des Roues de Locomotives). E. Sauvage. Illustrated description of a device invented by M. Lambert. 1500 w. Bul Soc d'Encour—Feb., 1909. No. 4216 G.

Shops.

Modern Plants for Building Steel Cars. Horace H. Lane. An illustrated study of modern plants, their equipment and methods. 5000 w. Jour Assn of Engng Socs—Sept., 1908. No. 351 C.

A Modern Steel Car Plant. Horace H. Lane. Describes the Detroit shops of the American Car & Foundry Co. 3500 w. Ir Age—Nov. 12, 1908. No. 216.

The New Car Shops of the Union Pacific at Omaha. Illustrated detailed description. 1500 w. R R Age Gaz—Jan. 29, 1909. No. 2147.

Battle Creek Shops of the Grand Trunk Ry. Illustrated description of shops recently opened for service. 3000 w. Ry & Engng Rev—Jan. 16, 1909. No. 1831.

The Works of the Chicago, New York & Boston Refrigerator Company. A reconstructed plant in Chicago, for the construction and repair of freight cars is illustrated and described. 2500 w. Eng Rec—Jan. 23, 1909. No. 2028.

New Shops of the, St. Louis & San Francisco R. R. Illustrated detailed description of shops at Springfield, Mo., recently completed. 6500 w. Ry & Engng Rev—Aug. 28, 1909. No. 7402.

Locomotive and Passenger Car Shops of the Frisco System at Springfield, Mo. Plans, illustrations, and description of extensive new shops and their equipment. 2000 w. R R Age Gaz—Sept. 3, 1909. No. 7586.

Car Shops of the Whipple Car Co. Illustrated detailed description of new shops in Chicago. 1200 w. Ry & Engng Rev—Oct. 23, 1909. No. 8777.

A Study of the General Arrangement of the Beech Grove Shops. Plan, sections and description of shops for the C.

C. C. & St. L. Ry. near Indianapolis. 1500 w. Am Engr & R R Jour—April, 1909. No. 3798 C.

The J. J. Beijnes Car Shops at Haarlem (De Koninklijke Fabriek van Rijtuigen en Spoorwagens, firma J. J. Beijnes te Haarlem). J. J. Beijnes. Description of this plant in Holland. Plate. 6500 w. De Ingenieur—Oct. 10, 1908. No. 616 D.

The Railway Workshops, Ipswich, O. Illustrated description of the equipment of one of the finest of modern workshops in Australasia. 1500 w. Aust Min Stand—April 7, 1909. No. 4620 B.

The Norris Locomotive Works. C. H. Caruthers. Historical review of one of the earliest plants for locomotive building, with illustrations of engines, and information relating to their performance. 5500 w. R R Age Gaz—Aug. 6, 1909. Serial, 1st part. No. 6919.

Locomotive Repair Shop of the Missouri, Kansas & Texas at Parsons, Kansas. Illustrated description of a new western shop with a longitudinal erecting shop. Plate. 1000 w. R R Age Gaz—Sept. 3, 1909. No. 7588.

The Scranton Locomotive Shops of the Lackawanna Railroad. Plan and illustrated description of large shops providing for 36 pits. Also their equipment. An extensive subway system connects all buildings. 2500 w. Eng Rec—Oct. 16, 1909. No. 8591.

No. 3845.

New Locomotive Repair Shops of the Grand Trunk, Battle Creek, Mich. Illustrated detailed description of the shops and their equipment. Plate. 4000 w. R R Age Gaz—April 16, 1909. No. 3981.

A Study of the Number and Kind of Machine Tools Required in a Railway Locomotive Machine and Boiler Shop. L. R. Pomeroy. Presents a scheme for determining the kind and number of machine tools required to furnish a desired output. 4500 w. Am Engr & R R Jour—April, 1909. No. 3796 C.

Handling Locomotive Tubes. Illustrated description of the manner in which flues are being worked in a B. & O. shop at Garrett, Ind., which turns out repaired boiler tubes at the rate of one a minute. 1000 w. R R Age Gaz—April 9, 1909. 8680 D.

Shop Kinks. A collection of kinks submitted in response to the competition under direction of this paper. Ills. 3000 w. R R Age Gaz—Oct. 1, 1909. No. 8245.

Improvements at the Works of the Kingston Locomotive Company, Kingston, Ontario, Canada. Henry Goldmark.

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Shops

MOTIVE POWER AND EQUIPMENT.

Train Speed

Describes the enlargement and modernizing of these works. Ills. 3500 w. Can Soc of Civ Engrs—Oct. 29, 1908. No. 284 N.

The Works of Kerr, Stuart & Co., Limited, at Stoke-on-Trent. Plate and illustrated description of works and equipment for building locomotives, and other railway materials. 2000 w. Engr, Lond—Oct. 15, 1909. No. 8946 A.

The New Locomotive Repair Shops in Schneidemühl (Die neue Lokomotiv-Reparatur Werkstätte in Schneidemühl). G. Promnitz. Illustrated description of these extensive works in Germany. 5000 w. Glasers Ann—Sept. 1, 1909. No.

See also Car Repairing, under MOTIVE POWER AND EQUIPMENT; and Yards, under PERMANENT WAY AND BUILDINGS.

Snow Plows.

A Rotary Snow Plow on the Orléans Railway (Chasse-Neige rotatif à Vapeur de la Compagnie d'Orléans). M. Conte. Illustrated description. 3000 w. Rev Gen des Chemins de Fer—May, 1909. No. 5727 C.

See also Snow Handling, under PERMANENT WAY AND BUILDINGS.

Tonnage Rating.

The Effect of the Physical Characteristics of a Railway upon the Operation of Trams. From Bul. 112 of the Am. Ry. Engng. & Main. of Way Assn. Gives formulae and methods for tonnage rating and for comparing projected lines. 1000 w. R R Age Gaz—July 16, 1909. Serial, 1st part. No. 6381.

Train Ferries.

A New Railway Train Ferry Service. An illustrated account of the new service between Germany and Sweden. 1500 w. Engr, Lond—July 16, 1909. Serial, 1st part. No. 6690 A.

See also Ferryboats, under MARINE AND NAVAL ENGINEERING.

Train Lighting.

Compressed Gas and Electric Car Lighting. George L. Fowler. An investigation of the present status of the car-lighting problem and the cost. 5000 w. R R Age Gaz—July 9, 1909. No. 6235.

History of Axle Lighting. W. L. Bliss. Abstract of a paper read before the Assn. of Car Lighting Engrs. 2000 w. Elec Rev, N Y—Dec. 19, 1908. Serial. 1st part. No. 1062.

Axle-Driven Head-End Electric Train Lighting System. Illustrated description of the system worked out by W. J. Bohan. Ills. 1500 w. R R Age Gaz—July 9, 1909. No. 6238.

Train Lighting at 110 Volts by Turbo-Generator on Locomotives. Illustrated description of the new equipment adopted on the suburban trains of the C., B. & Q. R. R. 700 w. Elec Wld—April 8, 1909. No. 4432.

Electric Train Lighting on European Railroads. Extracts from a paper by Max Buttner, before the Assn. of Car Lighting Engrs., Chicago. Information in regard to the extensive use of electric light, the equipments used, &c. 3000 w. Ry & Engng Rev—Oct. 23, 1909. No. 8778.

See also D. C. Dynamos, under ELECTRICAL ENGINEERING, DYNAMOS AND MOTORS.

Train Resistance.

Train Resistance. A. Stucki. Considers the different elements entering into train resistance, and the conditions under which each will appear. 2500 w. R R Age Gaz—May 7, 1909. No. 4562.

Graphic Presentation of Train Resistance Formulas. Sidney C. Carpenter. Table and diagram with explanation. 300 w. R R Age Gaz—April 30, 1909. No. 4368.

Train Resistance. F. J. Cole. A comparison of the views of different theorists, with notes from actual practice on American roads. 3500 w. R. R. Age Gaz—Aug. 27, 1909. Serial, 1st part. No. 7399.

Effect of Physical Characteristics Upon Train Operation. John D. Isaacs and E. E. Adams. From Bul. of Am. Ry. Engng. & Main. of Way Assn. Work for computing the behavior of any train on any grade. 3000 w. Eng Rec—July 31, 1909. No. 6798.

The Traction of Freight Trains at Different Speeds. Clinton S. Bissell. Explains the development of equations and curves showing weights of freight trains for various speeds and car weights on 1% and 3% grades. 2500 w. Pro Am Soc of Civ Engrs—Sept., 1909. No. 8181 E.

The Resistance of Railway Trains. Albert Frank. Statements in reply to Prof. Carus-Wilson's criticism of the experimental formulae established by the author. 2000 w. Bul Int Ry Cong—May, 1909. No. 5683 G.

Some Recent Train Resistance Formulae. Lawford H. Fry. Gives for comparison, formulae developed from recent tests on the Continent, describing some of the methods employed. 3500 w. Engr, Lond—March 26, 1909. Serial, 1st part. No. 3791 A.

Train Speed.

A Simple Method of Determining Train

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Trucks

Speed from Locomotive Efficiency (Ueber ein einfaches Verfahren zur Ermittlung der Fahrzeiten der Eisenbahnzüge nach der Leistungsfähigkeit der Lokomotiven). Erwin Lihotzky. A mathematical demonstration. Ills. Serial. 1st part. 2000 w. Zeitschr d Oest Ing u Arch Ver—April 9, 1909. No. 4891 D.

Trucks.

See Wheel Base, under MOTIVE POWER AND EQUIPMENT.

Valve Gears.

See Locomotive Failures, under MOTIVE POWER AND EQUIPMENT.

Water Supply.

See Boiler Waters, under MECHANICAL ENGINEERING, STEAM ENGINEERING.

Wheel Base.

The Wheel Base of Railway Rolling Stock. Roger Atkinson. A study of the action of different arrangements of wheel base and trucks. Ills. 3000 w. Ry & Loc Engng—Jan., 1909. No. 1449 C.

Wheels.

Car Wheels. Extracts from report of

NEW PROJECTS.

Erie

Committee of the Master Car Builders' Assn. Ills. 5000 w. Ry & Engng Rev—July 10, 1909. No. 6265.

A New Process of Making Chilled Car Wheels. Thomas D. West. Discusses defects of present chilled wheels and their cause, and gives information in regard to a recent process whereby wheels with an even depth of chill are obtained. Ills. 1500 w. Ir Age—Aug. 5, 1909. No. 6891.

Car Wheel Forging and Conditions of Steel for High Service. Jas. H. Baker. Illustrates and describes methods, explaining their advantages. General discussion. 8000 w. Pro Engrs' Soc of W Penn—April, 1909. No. 4554 D.

Flat-Spots on Car Wheels. Prof. Charles H. Benjamin. Illustrates and describes an apparatus for testing such wheels and determining the impact due to flat spots, and the rail deflection. General discussion. 7500 w. Pro W Ry Club—Nov. 17, 1908. No. 1299 C.

Schoen Steel Wheels. Information concerning standard designs and specifications for various classes of service. Ills. 3000 w. Ir Age—June 17, 1909. No. 5566.

NEW PROJECTS

Canadian Pacific.

Sudbury-Kleinburg Branch of the Canadian Pacific. F. S. Darling. A new line in the Georgian Bay region of Ontario is illustrated and described, and information given concerning conditions. 1600 w. R R Age Gaz—May 14, 1909. No. 4659.

C. C. & O.

The Carolina, Clinchfield & Ohio Railway. George L. Fowler. Gives the geographical and geological location, describes construction work, stations, equipment, etc. Fully illustrated. 11000 w. R R Age Gaz—March 19, 1909. No. 3289.

Chile.

The Construction of the Transandine Railway. Illustrated description of the connecting link in the first railway to join the Atlantic and Pacific Oceans across South America. 1500 w. Eng Rec—June 5, 1909. No. 5277.

The Arica-La Paz Railway. Illustrated description of a proposed line between Chile and Bolivia, presenting engineering features of great interest. 1500 w. Engr, Lond—April 30, 1909. No. 4630 A.

C. M. & St. P.

The Extension of the Chicago, Mil-

waukee & St. Paul Railway to the Pacific Coast. An illustrated account of this new line. 1200 w. Sci Am—Feb. 20, 1909. No. 2528.

Coal & Coke Ry.

Construction of the Coal & Coke Ry. Map and illustrated description of line from Elkins to Charleston, W. Va., giving a new route from the Kanawha River to Chesapeake Bay. 1200 w. Ry & Engng Rev—March 27, 1909. No. 3547.

England.

The Wilmslow and Levenshulme Railway. A new line in England, constructed by the London & North-Western Ry. Co., to open a new residence district and to relieve Stockport Yard. Ills. 1200 w. Engr, Lond—Jan. 29, 1909. No. 2369 A.

The Kingsbury and Water Orton Railway. Illustrated description of a new line recently opened by the Midland Railway Co., England. 2000 w. Engr, Lond—May 7, 1909. No. 4730 A.

Erie.

The Guymard Cut-Off. Illustrates and describes the short cut on the Erie R. R. between Guymard, N. Y., and Newburgh Junction. 1200 w. R R Age Gaz—Nov. 6, 1908. No. 130.

RAILWAY ENGINEERING

India

PERMANENT WAY AND BUILDINGS.

Cable Railways

India.

The Pegu-Moulmein Railway and Sitang River. A. Stewart Buckle. An illustrated account of the construction of this recently completed railway in Burma. 3500 w. Engr, Lond—June 4, 1909 Serial 1st part. No. 5534 A.

Mexico.

The Mexican Central Railway's Pacific Extension. Detailed description with plan of the extension and the Manzanillo terminal. 3500 w. Eng Rec—Jan. 9, 1909. No. 1576.

Nigeria.

Railways in Northern Nigeria. Describes the conditions existing and the railways under construction. Plate. 2500 w. Engr, Lond—Sept. 17, 1909. No. 8131 A.

Southern Pacific.

The Southern Pacific Lines in Mexico. Map and illustrated account of the construction of a main trunk line and branches on the west coast. 3000 w. R R Age Gaz—Jan. 1, 1909. No. 1461.

Transandine.

The History of the Transandine Railway. An illustrated description and his-

torical review of this project, which will give railway connection between Buenos Ayres and Valparaiso. 3000 w. Bul Am Reps—March, 1909. No. 3191 N.

Virginia.

The Carolina, Clinchfield & Ohio Ry. Illustrated detailed description of the physical characteristics of a new line, to develop a new coal district of Virginia. 6000 w. Eng News—Jan. 21, 1909. No. 1872.

See also Chile, under New Projects.

Virginian Ry.

Construction of the Virginian Ry. Illustrated detailed description of the construction work on this line, laid out, principally, to handle the heavy coal traffic between West Virginia and the seaboard at Norfolk. 5000 w. Ry & Engng Rev—March 13, 1909. No. 3136.

Western Pacific.

The Western Pacific. P. S. Hildreth. The second of a series of articles dealing with this road now approaching completion. An illustrated account of the location, grading, alinement, terminal facilities, and roadbed. 4000 w. R R Age Gaz—March 19, 1909. No. 3290.

PERMANENT WAY AND BUILDINGS

Ballast.

Broken Stone and Gravel Plants. From the report on Ballasting, presented at the convention of the Am. Ry. Engng & Main. of Way Assn. Describes a number of plants which supply broken stone or gravel for track purposes. 2500 w. Eng Rec—March 20, 1909. No. 3268.

The New Road Ballast of the Union Pacific Railroad. Eliot Blackwelder. Gives an analysis of the material used for ballast on this fine road. Ills. 1000 w. Wis Engr—Feb., 1909. No. 4315 D.

A Gravel Washing Plant on the Richmond, Fredericksburg and Potomac R. R. E. M. Hastings. Illustrated detailed description of a plant for the purpose of washing gravel for ballast. 1800 w. Eng News—April 15, 1909. No. 3978.

Gravel Washing Plant, Richmond, Fredericksburg & Potomac R. R. Illustrated description of this washing plant, with editorial on materials used for ballast. 3000 w. Ry & Engng Rev—April 10, 1909. No. 3879.

Bridges.

Guard Rails and Deck Construction for Railway Bridges. Information concerning prevailing practice, especially on American railways. Also editorial. Ills. 9000 w. Eng News—Sept. 9, 1909. No. 7624.

See also under CIVIL ENGINEERING, BRIDGES; and Track Construction, under PERMANENT WAY AND BUILDINGS.

Cable Railways.

The Steepest Passenger Cable Railway in Europe. E. Ommeganck. Illustration and brief account of the Virgl railway, in the Tyrol, a part of which has a 70% grade. 600 w. R R Age Gaz—Aug. 6, 1909. No. 6922.

A Cable Railway on the Island of Capri. Brief illustrated description of this recent installation. 700 w. Sci Am Sup—Oct. 16, 1909. No. 8584.

Determining the Profile of a Cable Railway for Uniform Speed, Taking Into Consideration the Weight of the Rope (Bestimmung des Profils einer Seilbahn,

RAILWAY ENGINEERING

Cable Railways

auf der unter Mitberücksichtigung des Gewichtes des Drahtseiles gleichförmige Bewegung möglich sein soll). C. Meissner. Mathematical. Ills. 2000 w. Schweiz Bau—Aug. 14, 1909. No. 7972 B.

Theory and Practice in Cable-Railway Construction (Beitrag zur Theorie und Praxis der Seilbahnen; die Hungerburgbahn, Tirol, und die Seilbahn auf die Tarajka, Hungary). E. E. Seefehlner. Refers specially to the Hungerburg and Tarajka cable railways. Ills. Serial. 1st part. 5500 w. Elektrotech u Maschinenbau—Aug. 1, 1909. No. 7992 D.

The Sacro Monte di Varese Funicular Railway (La Tramvia funicolare del Sacro Monte di Varese). Alcide Sculati. Illustrated description. 2200 w. Ing Ferro—Sept. 1, 1909. No. 8642 D.

Car Dumping.

See same title, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING.

Coaling Plants.

A Large Concrete and Timber Coal Pocket. Illustrated description of coal pockets for the Philadelphia & Reading Ry. at Philadelphia. 1500 w. Eng Rec—May 8, 1909. No. 4574.

Construction.

Railway Construction Notes. F. Pardoe Wilson. Notes on shrinkage and overhaul, road crossings, etc. 1500 w. Can Soc of Civ Engrs—April 15, 1909. No. 4321 N.

Railway Construction Notes. F. Pardoe Wilson. Suggestions in regard to earth shrinkage and overhaul, and the use of graders and steam shovels on railroads. Diagrams. 2000 w. Can Soc of Civ Engrs—April 15, 1909. No. 4531 N.

Hydraulic Construction of Large Embankments on the Chicago, Milwaukee & Puget Sound Ry. Illustrated detailed description of this work. 4000 w. Eng News—May 27, 1909. No. 5017.

Construction Work on the Spokane, Portland & Seattle Ry. Illustrated description of a recently completed line of 377 miles, which shows heavy work. 1000 w. Ry & Engng Rev—Sept. 11, 1909. Serial. 1st part. No. 7614.

The Construction of the Hopatcong-Slateford Low-Grade Cut-Off of the Lackawanna Railroad. Illustrated description of the construction work which will cost about \$333,000 per mile. 4500 w. Eng Rec—April 17, 1909. Serial. 1st part. No. 4009.

PERMANENT WAY AND BUILDINGS.

Crossings

A Traveling Bridge Suspended from a Cableway for Making Fills. Illustrated description of apparatus being used on the big fills of the D. L. & W. cut-off near Blairstown, N. J. 1200 w. Eng News—April 22, 1909. No. 4157.

Temporary Work on the Canadian Pacific Railway. J. Grant MacGregor. Illustrates and describes temporary work employed during construction. 4500 w. Can Engr—May 14, 1909. No. 4674.

National Transcontinental Railway. Duncan MacPherson. Read before the British Assn. for the Adv. of Science. Map and general description of methods pursued in locating and constructing the line. 2500 w. Can Engr—Sept. 10, 1909. No. 7688.

The Davos-Filisur Railway (Die Bahnlinie Davos-Filisur). P. Saluz. Describes the construction of an extremely difficult mountain line in Switzerland. Ills. Serial. 1st part. 1700 w. Schweiz Bau—June 5, 1909. No. 6578 B.

See also C. C. & O., Coal & Coke Ry., Virginian Ry., and Western Pacific, under NEW PROJECTS; and Conveyors, under MECHANICAL ENGINEERING, TRANSPORTING AND CONVEYING.

Crossing Gates.

An Automatic Crossing Gate. Illustrated description of a gate near Montreux, Switzerland. 500 w. R R Age Gaz—Aug. 20, 1909. No. 7170.

See also same title, under STREET AND ELECTRIC RAILWAYS.

Crossings.

Grade Crossings, H. J. Pfeifer. Discusses matters in connection with the elimination of grade crossings. General discussion follows. 7000 w. Pro St. Louis Ry Club—May 14, 1909. No. 5545.

Railroad Crossings. W. C. Sparks. Read before the Cent. Elec. Ry. Assn. Discusses construction, maintenance, etc. 1500 w. Elec Ry Jour—Nov. 21, 1908. No. 368.

Building and Maintaining Railroad Crossings. W. C. Sparks. Read before the Cent. Elec. Ry. Assn. Discusses points that should be considered in their construction and economical maintenance. 1500 w. Engng-Con—Dec. 30, 1908. No. 1454.

Grade Crossing Elimination. A. D. Chidsey, Jr. Gives a condensed summary of the status of grade crossing abolition, covering legislation, amount of work, and costs. 1800 w. Eng News—April 1, 1909. No. 3759.

The Railway Crossing. F. L. Somerville. Discusses the development and

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proposed elimination of grade crossings. 5000 w. Can Engr—Feb. 12, 1909. No. 2437.

Abolition of Railroad Grade Crossings in Philadelphia. Describes work of elevating tracks which will cost about \$10,000,000. Ills. 3000-w. Eng Rec—April 17, 1909. No. 4015.

The Kinsman Road Improvement in Cleveland, Ohio. D. M. Taylor. An illustrated description of extensive grade crossing elimination. 1500 w. Ry & Engng Rev—Nov. 21, 1908. No. 465.

The Protection of Grade Crossings. Gives particulars as to British practice in the protection of highway and railway grade crossings, suggesting remedies for evils in Canada. Ills. 2500 w. Can Engr—May 21, 1909. No. 4915.

The Disadvantages of Concrete Foundations for Railway Crossings. R. P. Black. Gives experience with such foundations and reasons for considering them a failure. Ills. 800 w. Eng News—April 29, 1909. No. 4360.

See also Concrete, under CIVIL ENGINEERING, BRIDGES.

Curves.

A Discussion of Spiral Curves. Discusses formulae of the measurement of spirals and their faults. 2500 w. Eng Rec—May 15, 1909. No. 4689.

The application of the Traverse Method to Railroad Curve Problems. William Clyde Willard. Gives the application of this method to the solution of several curve problems. 1000 w. Eng News—Sept. 30, 1909. No. 8205.

Easement Curves. Robert H. Smith. Mathematical discussion. 3000 w. Engr, Lond—June 4, 1909. No. 5533 A.

I. High Speed on Railway-Curves. John Wyatt Spiller. Examines the additional forces brought into action, and the best means of neutralizing their ill effects. II. A Practical Method for the Improvement of Existing Railway-Curves. William Hamilton Shortt. Explains method of introducing transition-curves. Two papers discussed together. 42000 w. Inst of Civ Engrs—Nos. 3706 and 3761. No. 8167 N.

The Maintenance of the Track at Curves. Mr. Weikard. Trans. from *Organ für die Fortschritte des Eisenbahnwesens*. Discusses the cause of irregularity of curves. 1400 w. Bul Int Ry Cong—April, 1909. No. 4982 G.

Parabolic Spirals (Raccordi parabolici). E. Benintende. A mathematical discussion of the calculation of transmission

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Elevated Railways

ends, with tables. Ills. 2700 w. Monit Tech—Feb. 20, 1909. No. 3350 D.

Joining Curves and Tangents (Note sur le Raccordement des Courbes et des Alignements dans les Voies de Chemins de Fer). M. Collot. A mathematical discussion of the method of laying out curves in railway track. Ills. 5500 w. Rev Gen des Chemins de Fer—May, 1909. No. 5726 G.

Easement Curves (Uebergangskurven und deren Anschluss an die Bahnkrümmungen). E. Haunold. Mathematical discussion of the calculation of transission ends with tables of data. Ills. 3500 w. Zeitschr d Oest Ing u Arch Ver—June 11, 1909. No. 6595 D.

See also Rail Stresses, under PERMANENT WAY AND BUILDINGS.

Cut Slopes.

The Use of Locomotive Ashes for Maintaining the Slopes of Cuttings. W. Bauer. Describes the method of application so as to protect the slopes against wet and frost. 1800 w. Bul Int Ry Cong—Dec., 1908. No. 2007 G.

Earth Slides.

See Washouts, under PERMANENT WAY AND BUILDINGS.

Earthwork.

A Rapid Method of Computing Earthwork (Calcul rapide des Terrassements d'après le Profil en long). M. Bitsanis. A mathematical demonstration of a method of obtaining approximate quantities of cuts and fills. Ills. 2000 w. Ann d Ponts et Chaussées—1908-VI. No. 3316 E + F.

Elevated Railways.

A Review of Track Elevation in Chicago. Shows the progress of the work since its inception. 3000 w. Eng News—June 3, 1909. No. 5219.

Chicago Track Elevation. M. K. Trumbull. Summary of a voluminous report dealing with the rebuilding of railways in Chicago. Map and tables. 3000 w. R. R Age Gaz—June 4, 1909. No. 5291.

Track Elevation in Chicago. Information from a recent work giving the history of the extensive work for the elimination of grade crossings. Map. 4000 w. Eng Rec—May 29, 1909. No. 5143.

Chicago Track Elevation of Burlington Railroad. Describes improvements involving the expenditure of \$3,500,000, and amounting to a total of 51.34 miles of single track and 35 street subways. Ills. 3500 w. Eng Rec—Aug. 21, 1909. No. 7304.

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Rail Creeping

New Chicago Approaches, Chicago and Northwestern Ry. Illustrates and describes the two four-track elevated approaches to the terminal of this railway. 3000 w. Eng Rec—Aug. 28, 1909. Serial, 1st part. No. 7386.

Some Features of Construction of the South Side Elevated Railroad. J. N. Darling. Describes improvements on this Chicago line, to meet the transportation requirements of rapid transit. Ills. Discussion. 8500 w. Jour W Soc of Engrs—Oct., 1908. No. 354 D.

Proposed Structural Improvements for the Elevated Terminal Loops at Chicago. Considers details of construction and equipment suggested in a recent report of Charles K. Mohler. 4000 w. Eng News—Dec. 17, 1908. No. 983.

The Trenton Avenue Elevated Railroad, Philadelphia. Illustrated description of a plate-girder viaduct carrying the tracks of a branch of the Pennsylvania R. R. 2500 w. Eng Rec—Aug. 7, 1909. No. 6950.

The Delaware Avenue Elevated Railway, Philadelphia. Illustrated detailed description of a steel viaduct about 4161 ft. long, built where settlement and lateral displacement were a serious consideration. 2000 w. Eng Rec—Oct. 23, 1909. No. 8705.

Estimated Unit and Total Costs of Railway Track Elevation at Wilkes-Barre, Pa. 1500 w. Engng-Con—March 10, 1909. No. 3095.

Elevating Tracks of the Philadelphia, Baltimore & Washington Railroad Through Wilmington, Del. H. S. Righter. A description of this work. 2500 w. Pro Engrs' Club of Phila—Oct., 1908. No. 4323 D.

Big Four Track Elevation at Indianapolis. Illustrated description of important track elevation, as a part of plan to eliminate grade crossings. 1200 w. R R Age Gaz—April 23, 1909. No. 4153.

An Armored Concrete Viaduct. C. Van Langendouck. Illustrated description of an elevated railway in Rotterdam. Sci Am Sup—Oct. 23, 1909. No. 8589.

The Experimental Section of Suspension Railway at the Rosenthal Tor in Berlin. Translated from *Zeit. des Ver. Deut. Eisenbahnverwaltungen*. An illustrated account of the structure and of its influence on the traffic. 2300 w. Bul Int Ry Cong—Oct., 1908. No. 171 G.

See also Viaducts, under CIVIL ENGINEERING, BRIDGES.

Embankments.

Holding Railway Banks With Grass. L. H. Pammel. Reports success with dif-

ferent kinds of grass. Ills. 1200 w. R R Age Gaz—April 2, 1909. No. 3736.

Fire Protection.

The Relation of Railway Fire-Protection Methods and Oil-Burning Locomotives to Forest Fires. Reports the results and conclusions of the Public Service Commission's investigations. 1800 w. Eng News—Aug. 19, 1909. No. 7144.

Freight Warehouses.

The Steele-Wedeles Company's Warehouse in Chicago. Illustrates and describes a warehouse serving as a central receiving and distributing station for the freight tunnel system, as well as for an extensive wholesale grocery business. 2500 w. Eng Rec—Dec. 12, 1908. No. 957.

Grade Reduction.

Reconstruction of a Portion of the Canadian Pacific Railway. An illustrated account of improvement in grades in the Kicking Horse Valley. 2000 w. Engr, Lond—Dec. 25, 1908. No. 1541 A.

Grade and Line Revision, and a Concrete Voussoir Arch Bridge; Cumberland Valley Ry. Illustrates and describes improvements for the elimination of a pusher grade, as well as reduction of grades and curvature, and including a 100 ft. span concrete arch. 800 w. Eng News—April 8, 1909. No. 3851.

See also Viaducts, under CIVIL ENGINEERING, BRIDGES.

Location.

General Instructions to Locating Engineers, Alaska Central Railway. Instructions prepared by G. A. Kyle to govern surveys. 10500 w. Engng-Con—April 21, 1909. No. 4152.

The Location of Railways in Mountainous Countries (*Die wirtschaftliche Linienführung bei Gebirgsbahnen*). L. Poterat. A discussion of economic considerations. Ills. 3000 w. Schweiz Bau—May 29, 1909. No. 5769 B.

Rack Railways.

The Chamonix and Mer de Glace Railway. William F. Johnston. Illustrated description of a new rack railway in the Mont Blanc region. 1500 w. Eng Rec—June 12, 1909. No. 5485

Rail Creeping.

Rail Creeping and Its Prevention (*Die Schienenwanderung und ihre Verhütung*). Alfred Wirth. An exhaustive study, describing rail-fastening devices. Ills. Serial, 1st part. 5000 w. Zeitschr d Oest Ing u Arch Ver—May 14, 1909. No. 5788 D.

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Rail Fastenings

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Rails

Rail Fastenings.

Screw Spikes and Improvements in Rail Fastenings. Abstract of W. C. Cushing's paper in a bulletin issued by the Am. Ry. Engng. & Main. of Way Assn., with editorial discussion. Ills. 7000 w. Eng News—May 20, 1909. No. 4778.

Rail Joints.

Rail Joints. Information as to the efficiency of different joints summarized from replies to questions sent to important roads. Ills. 2200 w. R R Age Gaz—March 19, 1909. No. 3294.

Rail Joints. Alexander Ross. Report for countries using the English language. 5200 w. Ills. and Tables. Bul Int Ry Cong—Aug., 1909. No. 8026 G.

Wheel-Carrying Rail-Joints and Tie Preservation. Max Barschall. Discusses the construction and trials. Ills. 900 w. Bul Int Ry Cong—Oct., 1908. No. 168 G.

A Study of Rail Joints (Etude des Joints des Rails). M. Pellarin. Report of a Commission appointed to make investigations in Belgium, Italy, Holland and Switzerland. Ills. 8000 w. Ann d Ponts et Chaussées—1908-III. No. 504 E + F.

A symmetrical Rail Joint (Note sur le Joint asymétrique). H. Bouchard. Describes the theory, construction and results. Ills. 3800 w. Rev Gen de Chemins de Fer—Jan., 1909. No. 2626 G.

Rail Records.

Pennsylvania Rail Record-Blanks. Gives blanks used for keeping a record of rail failures, with related information. 1000 w. R R Age Gaz—Jan. 1, 1909. No. 1462.

Rails.

A Reliable Steel Rail and How to Make It. James E. York. Considers the causes of poor quality and how a reliable quality can be made. Illustrates the York mills for solidifying ingots, and for rolling rails. 4500 w. Bul Am Inst of Min Engrs—May, 1908. No. 5002 F.

The Hardness and Wear of Steel Rails. Editorial on the service of rails and the improved methods of testing for hardness. 1700 w. R R Age Gaz—Nov. 27, 1908. No. 628.

Comparative Rail Specifications. Gives in parallel columns five specifications for Bessemer and open hearth steel rails brought up to date, with editorial. 9500 w. R R Age Gaz—May 21, 1909. No. 4798.

Specifications for 90-lb. Bessemer and Open Hearth Steel Rails for the Harriman Lines. Gives specifications to which the

1909 orders are purchased. 1500 w. R R Age Gaz—July 30, 1909. No. 6780.

Method of Reporting and Studying Rail Failures on the Harriman Lines. Taken from a paper by J. D. Isaacs, read before the Am. Main. of Way Assn. Outlines the methods of studying the statistics of rail failures. 2500 w. R R Age Gaz—Nov. 13, 1908. No. 243.

Rolled Manganese Steel Rail. Gives a report of tests made of rolling rails of different analyses. Ills. 1200 w. R R Age Gaz—Dec. 11, 1908. No. 924.

Rolled Manganese Steel Rails. Jas. B. Strong. Information concerning the properties of these rails. Ills. 1500 w. Ry & Engng Rev—March 13, 1909. No. 3135.

Rolled Manganese Steel Rails. Illustrated article giving information concerning the rolling of the Manard rail of the Pennsylvania Steel Co., and the testing machine. 1600 w. Ir Age—April 22, 1909. No. 4097.

The Use of Titanium in Steel for Rails, Car Wheels, Etc. Charles V. Slocum. Explains the important advantages gained by the use of this element. 2200 w. Elec-Chem & Met-Ind—March, 1909. No. 2990 C.

Ferrotitanium Steel Rails. Reports experience of the N. Y. Central lines, and the excellent results secured under the 1908 specifications. 1600 w. Ir Age—March 25, 1909. No. 3485.

Titanium Alloy in Rails and Car-Wheels. Charles V. Slocum. Information concerning the remarkable improvement which titanium gives to steel and iron. Discussion. 6500 w. Pro Ry Club of Pittsburg—April 23, 1909. No. 4913 C.

The Use of Titanium Rail on the Baltimore and Ohio Railroad. A. W. Thompson. States the advantages claimed for this alloy and gives results of tests and related information. 2500 w. Can Engr—Aug. 27, 1909. No. 7408.

The New 85-lb. Rail Section of the Canadian Pacific Ry. Describes the design of this new rail section. Also editorial review of recent development. 3500 w. Eng News—March 11, 1909. No. 3103.

Effect of Flat Wheels on Rails. H. H. Vaughan. A mathematical analysis. 1000 w. Am Engr & R R Jour—Dec., 1908. No. 847 C.

The Hammer Blow from Incorrect Counterbalance. H. H. Vaughan. Gives report of a study made of a serious case of damaged rails on the Canadian Pacific Ry. 1800 w. Am Engr & R R Jour—Feb., 1909. No. 2237 C.

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Rails

Dark Carbon Streaks in Segregated Metal in Split Heads of Rails. Dr. P. H. Dudley. Read before the Am. Soc. for Test. Mat. Illustrated report of investigations. 2500 w. Ry & Engng Rev—July 10, 1909. No. 6264.

Rail Failures Due to Burns and Crystallization, Caused by Slipping of Engine Drivers, Baltimore & Ohio Railroad. A. W. Thompson. From Bul. 111 of the Am. Ry. & Main. of Way Assn. Gives analyses of rails causing derailments, showing the weakening. Ills. 2000 w. Can Engr—July 23, 1909. No. 6638.

Further Investigations of Broken Rails. Henry Fay and Rufus W. G. Wint. Read at meeting of Am. Soc. for Test. Mat. An illustrated discussion of types of fracture, their causes and suggestions for improving the quality. 2500 w. R R Age Gaz—Aug. 6, 1909. No. 6923.

Character, Distribution and Calculation of the Horizontal Stresses in Railway Tracks (Role, Répartition et Calcul des Actions horizontales dans les Voies des Chemins de Fer). M. L. Schlusel. A theoretical discussion of the stresses on the rail heads caused by transverse displacement of the wheels. Ills. 18000 w. Mem Soc Ing Civ de France—Sept., 1909. No. 8600 G.

See also Steel Specifications, under CIVIL ENGINEERING, MATERIALS OF CONSTRUCTION.

Rail Stresses.

A Study of Rail Pressures and Stresses in Track Produced by Different Types of Steam Locomotives on Curves. E. E. Stetson. From Bul. No. 104, of the Am. Ry. Engng. & Main. of Way Assn. Preface by W. C. Cushing. 5000 w. Eng News—Nov. 26, 1908. No. 640.

Rail Testing.

Machine for Testing Railway Rails. Illustrated description of the rail testing machine designed by the Pennsylvania Steel Co. 1200 w. Ry & Loc Engng—June, 1909. No. 5232 C.

Reconstruction.

The Waterbury Improvements of the New Haven Railroad. Illustrates and describes improvements including the change from single to double track, realignment, elimination of grade crossings, etc. 2500 w. Eng Rec—May 29, 1909. No. 5144.

Revision of Line of the Kanawha & Michigan Ry.; With Unit Costs of the Work. J. A. Stocker. Describes revisions of line and grade in Ohio, eliminating many objectionable curves. Ills. 2000 w. Eng News—Jan. 7, 1909. No. 1637.

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Roundhouses

Rebuilding the Cairo Division of the Big Four. An illustrated account of the methods used, of the terminal facilities, operation, etc. 2000 w. R R Age Gaz—Feb. 26, 1909. No. 2776.

Indianapolis-Terre Haute Double Track of the Big Four. Illustrates and describes work involving a change from single to double track, reducing grades, curves, etc. 2000 w. R R Age Gaz—March 26, 1909. No. 3517.

The Widening of Wemyss Bay Railway. Illustrated detailed description of interesting work to meet conditions of congested traffic on the shores of the Firth of Clyde. Plates. 4500 w. Engng—July 2, 1909. Serial, 1st part. No. 6303 A.

Restoration of Traffic on the Right Bank of the Rhone Following the Washouts Caused by the Floods of October, 1907 (Rétablissement de la Circulation sur la Rive droite du Rhone à la suite des Coupures causées par les Inondations d'Octobre 1907). M. Ruffieux. Description of the repair work. Ills. 3000 w. Rev Gen de Chemins de Fer—Feb., 1909. No. 3323 G.

See also Grade Reduction, under PERMANENT WAY AND BUILDINGS.

Record Systems.

See Filing Systems, under INDUSTRIAL ECONOMY.

Roundhouses.

Engine Terminal Requirements. A. O. Cunningham. Discusses the design, arrangement, and cost. 2500 w. Minn Engr—March, 1909. No. 4068 C.

Labor and Time Saving Devices in the Roundhouse. Illustrates and describes devices selected from the McKees Rocks roundhouse of the Pittsburg & Lake Erie R. R. 1600 w. Am Engr & R R Jour—April, 1909. No. 3800 C.

Some Engine House Auxiliaries. William Elmer. Describes auxiliaries that have been found of service in expediting the movement of locomotives at terminals. Ills. Discussion. 8500 w. Pro Ry Club of Pittsburg—Jan. 22, 1909. No. 3192 C.

Engine Terminal Facilities Constructed by the Wabash Railroad Company at Decatur, Ill. A. O. Cunningham. Illustrated detailed description of recent improvements. 4000 w. Jour Assn of Engng Socs—Dec., 1908. No. 2414 C.

East Buffalo Roundhouse. Illustrated description of a new 30 stall roundhouse for passenger locomotives of the N. Y. C. & H. R. R. R. 3000 w. Am Engr & R R Jour—Jan., 1909. No. 1593 C.

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Sanitation

Wabash Locomotive Terminal at Decatur, Ill. Illustrated description of interesting features. 2000 w. R R Age Gaz—Nov. 6, 1908. No. 133.

See also Reinforced Concrete, under CIVIL ENGINEERING, CONSTRUCTION.

Sanitation.

Railway Sanitation. Dr. J. N. Hurty. Discusses matters relating to the care of cars, stations and railway roadbeds. 1500 w. R R Age Gaz—July 9, 1909. No. 6234.

Shops.

A Large Locomotive-Erecting Shop. Illustrated description of erecting shop No. 2, for the N. Y. C. & H. R. R. Co. at Albany, N. Y. 2200 w. Eng Rec—March 20, 1909. No. 3271.

Snow Handling.

Methods of Snow-Fighting on Railroads. A. W. Wheatley. Read before the Can. Ry. Club. Discusses methods of keeping the railroad open, describing the rotary snow-plow and its operation. 2500 w. Engng-Con—May 26, 1909. No. 5045.

Spikes.

Screw-Spikes in European Railroads. Notes from a paper by W. C. Cushing, quoting extracts from a letter from E. Siegler, giving details of European practice. 3000 w. Eng Rec—Oct. 9, 1909. No. 8434.

Stations.

The Manhattan Terminal of the Central Railroad of New Jersey. Illustrated detailed description, confined principally to the passenger station. 1700 w. R R Age Gaz—Nov. 6, 1908. No. 129.

New Lackawanna Station at Scranton. Illustrated description. 1000 w. R R Age Gaz—Nov. 13, 1908. No. 242.

The New Scranton Station of the Delaware, Lackawanna & Western Railroad. Illustrated description of the facilities of this fine station and office building. 2000 w. Eng Rec—Nov. 28, 1908. No. 694.

Chattanooga Passenger Terminal Station. Illustrated detailed description of a station serving five railways. 1500 w. R R Age Gaz—March 19, 1909. No. 3292.

The New Chicago Terminal for the Chicago and Northwestern Railway. Alfred Hoyt Granger. A statement of conditions at Chicago and brief illustrated description of this fine building and its arrangements. 2500 w. Archt Rec—Dec., 1908. No. 494 C.

Union Passenger Station at Salt Lake City. Illustrated description of a reinforced concrete structure on pile founda-

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Terminals

tions. 2000 w. Ry & Engng Rev—April 17, 1907. No. 4052.

Glasgow Central Station Extension. Donald A. Matheson. Abstract of a paper read before the Inst. of Civ. Engrs. Describes the reconstruction and equipment to meet modern requirements. 2200 w. Engng—Nov. 20, 1908. No. 740 A.

Railway Facilities at Nottingham. Reviews the stations that have been in service in this English city, describing particularly the Victoria and the Midland stations recently built. Plans. 2800 w. Engr, Lond—April 30, 1909. No. 4631 A.

The Development and Present Transformation of Railway Facilities in Cologne (Die Entwicklung und gegenwärtige Umgestaltung der Bahnanlagen in Cöln). Herr Wienecke. Reviews improvements to stations and yards. Ills. 8000 w. Glasers Ann—April 1, 1909. No. 5055 D.

The Enlargement of the Vohwinkel Station and its Improvement of Conditions (Die Bahnhofserweiterung in Vohwinkel und ihre Einwirkung auf den Betrieb). Herr Claus. Describes the extensive improvements. Ills. Plate. 4500 w. Glasers Ann—May 15, 1909. No. 5784 D.

Railway Improvements in Rotterdam (Spoorwegverbindingen te Rotterdam). A. Plate. Describes a new station, terminal improvements at Delft harbor, etc. Ills. 14000 w. De Ingenieur—Sept. 25, 1909. No. 8921 D.

See also Steel, under CIVIL ENGINEERING, CONSTRUCTION.

Surveying.

See same title, under CIVIL ENGINEERING, MEASUREMENT.

Switches.

Practical Railway Track Work—Switches. K. L. Van Auken. A consideration of switch construction work. 4000 w. Wis Engr—April, 1909. No. 5689 D.

Terminals.

Railway Terminals. Illustrated description of the extensive terminal improvements in progress in New York City. 4000 w. Sci Am—Dec. 5, 1908. No. 817.

Recent Work on the New York Terminal of the New York Central Railroad. Illustrates and describes details of difficult reconstruction. 2000 w. Eng Rec—Dec. 19, 1908. No. 1060.

Steel Construction in the New York Terminal of the New York Central & Hudson River Railroad. Outlines the general character of the terminal yards and illustrates and describes features of

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the steel structures. 3800 w. Eng Rec—April 10, 1909. No. 3859.

New York Passenger Terminal, Central R. R. of New Jersey. Interesting features of the new terminal at the foot of Liberty St. are illustrated and described. 2500 w. Eng Rec—May 22, 1909. No. 4924.

Erie Railroad Terminal Improvements at Jersey City. Illustrated detailed description of the Erie portion of the subway of the Hudson tunnels, which is designed to support very heavy loads. 1500 w. Eng Rec—Oct. 16, 1909. 1800 w. Eng Rec—Oct. 16, 1909. No. 8597.

Map of Chicago Terminal District. Map and index showing all the yards in the switching district and the connections. R R Age Gaz—Aug. 20, 1909. No. 7168.

Electrical Features of the New Northwestern Railroad Terminal in Chicago. Illustrated general account of the power plant, etc. 3500 w. Elec Wld—July 8, 1909. No. 6219.

Proposed Terminal Improvements at St. Louis. Plans and description of the improvements proposed, and report of the restrictions that are the cause of controversy and delay. 2000 w. R R Age Gaz—Sept. 10, 1909. No. 7696.

Duluth Passenger Terminal of the Wisconsin Central Railway. Detailed description of a terminal where the physical conditions made the construction difficult. Ills. 3500 w. Eng Rec—Sept. 25, 1909. No. 8069.

The New Soo Line Terminal in St. Paul. Illustrated description of the terminal arrangements and construction methods. 4000 w. Eng Rec—Oct. 9, 1909. No. 8440.

Railroad Terminal Improvements at Providence, R. I. George B. Francis. Gives the history and illustrated description of the union terminal station developments which have been in progress for the last ten years. 17500 w. Jour Assn of Engng Soc's—May, 1909. No. 6350 C.

The New Terminal Station, Birmingham, Ala. P. Thornton Marye. Illustrated description. Plates. 2000 w. Am Archt—July 14, 1909. No. 6316 C.

Louisville and Nashville Terminals at Pensacola. Illustrated description of wharves, track facilities, and improvements for the export and import cargoes. 1000 w. R R Age Gaz—March 12, 1909. No. 3099.

Glasgow Central Station Extension. Donald Alexander Matheson. Describes the leading features of the extension

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Track Construction

scheme. Also discussion. Ills. 66000 w. Inst of Civ Engrs, No. 3737—Nov. 10, 1908. No. 6447 N.

A Rail and Water Freight Terminal at Bristol, England; Great Western Ry; Illustrated description of interesting work for the extension of terminal facilities. 1500 w. Eng News—Dec. 10, 1908. No. 936.

An English Passenger Terminal Station with Novel Track Arrangement. Plan and description of the Victoria Station (London) of the London, Brighton and South Coast Ry. 2000 w. Eng News—Feb. 11, 1909. No. 2395.

See also Roundhouses, Stations, and Tunnels, under PERMANENT WAY AND BUILDINGS.

Tie Rods.

A Suggestion for Tie Rods. H. Herden. Describes the proposed use of rods to prevent the spreading of rails, explaining the advantages claimed. Ills. 1500 w. R R Age Gaz—May 21, 1909. No. 4901.

Ties.

Steel Tie and Concrete Tie Construction. Charles H. Clark. Abstract of paper read before the St. Ry. Assn. of the State of N. Y. Information concerning these ties, comparing their cost with oak tie construction. 2000 w. Elec Ry Jour—Nov. 14, 1908. No. 236.

Results of Trials of Steel and Concrete Ties. Abstract of the report of the Am. Ry. Engng. & Main. of Way Assn. Gives results of investigations made which are generally discouraging. 3000 w. Eng News—Sept. 30, 1909. No. 8210.

Iron Sleepers and Wooden Sleepers. Editorial in *Zeit. des Ver. Deutsch Eisenbahn*. Discusses their relative economy. 5500 w. Bul. Int Ry Cong—Jan., 1909. No. 2436 G.

Railway Ties in France. A U. S. Consular Report from Havre describing use of timber ties on French railways and opportunities for the introduction of American ties. 900 w. Ry & Engng Rev—June 5, 1909. No. 5369.

See also Rail Joints, under PERMANENT WAY AND BUILDINGS; Timber Preservation, under CIVIL ENGINEERING, MATERIALS OF CONSTRUCTION; and Ties, under STREET AND ELECTRIC RAILWAYS.

Track Construction.

The Detailed Cost of Laying Side Tracks and Switches, Including Labor and Materials. Gives eight examples of the actual cost of this sort of work on a

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Tunnels

western railway. 1200 w. Engng-Con—Nov. 4, 1908. No. 121.

Practical Railway Track Work. K. L. Van Auker. The present article considers double-tracking and relaying track. 4500 w. Serial, 1st part. Wis Engr—Feb., 1909. No. 4316 D.

Mechanical Appliances for Track-Laying. J. F. Springer. Illustrated description of the recent developments in machines for the continuous construction of permanent way. 5500 w. Cassier's Mag—June, 1909. No. 5542 B.

Tracklaying Apparatus. J. F. Springer. Illustrates and describes the Harris Track-laying Machine and its operation. 2000 w. Ry & Loc Engng—July, 1909. No. 6119 C.

A New Design of Railway Track Construction. Describes a system which eliminates cross-ties and relies on well-rolled bed of stone ballast to carry the load. 1000 w. Eng News—Sept. 30, 1909. No. 8209.

Track Laying on the Guymard Cutoff of the Erie R. R. Brief illustrated description of the Hurley track-laying machine and its operation. 600 w. Engng-Con—March 10, 1909. No. 3094.

Bush Track Construction. Illustrated description of track structure in the Bergen Hill tunnel, Jersey City, N. J., of the D. L. & W. Ry., invented by Lincoln Bush. 2500 w. R R Age Gaz—April 23, 1909. No. 4154.

A Special Type of Track Construction for Tunnels and Subways. Illustrates and describes the Bush system as built in the Bergen Hill tunnel of the D. L. & W. Ry. 2200 w. Eng News—Aug. 19, 1909. No. 7139.

Track Superstructure in Tunnels. Brief illustrated description of the type being considered by the Pennsylvania R. R. Also editorial. 1700 w. R R Age Gaz—Nov. 6, 1908. No. 135.

Track Superstructure on German Railways (La Superstructure des Voies des Chemins de Fer Allemande). M. Blum. Illustrates and describes types of ties, rails, rail joints, etc. 6000 w. Rev Gen d Chemins de Fer—Nov., 1908. No. 1111 G.

Strengthening the Track and the Bridges with a View to Increasing the Speed of Trains. J. W. Jacomb-Hood. The report for Great Britain. 12000 w. Bul Int Ry Cong—July, 1909. No. 8021 G.

See also Ballast, under PERMANENT WAY AND BUILDINGS; and Earthwork, under CIVIL ENGINEERING, CONSTRUCTION.

Track Depression.

Track Depression of the Seaboard Air Line Railway at Birmingham, Ala. Philip Aylett. Illustrated detailed description of the general features, construction, and requirements. 3500 w. Eng News—Oct. 1, 1908. No. 210.

Track Maintenance.

Railway Maintenance of Way. E. E. R. Tratman. From a paper read before the Road. & Main. of Way Assn. Discusses problems in track construction and maintenance. 2500 w. Ry & Engng Rev—Nov. 21, 1908. No. 466.

Annual Maintenance of Way Convention. A report of the Chicago meeting, March 16, 17, 18, 1909, with committee reports, discussions, addresses, etc. Ills. 90000 w. R R Age Gaz—March 19, 1909. No. 3293.

The Cost of Permanent Way Renewals. R. Price Williams. Read before the Ir. & St. Inst. Considers the serviceable life and cost of renewals of permanent way of British railways. 3000 w. Engng—Oct. 8, 1909. No. 8895 A.

Modifications of Ordinary Methods in the Execution of Work on the Roadbed of an Operating Railway (Ueber Modifikationen normaler Baumethoden anlässlich der Ausführung diverser Objekte im Unterbau eines betriebenen Bahngeleises). Johann Basta. Discusses various classes of work. Ills. Plates. Serial. 1st part, 5000 w. Oest Wochenschr f d Oeffent Baudienst—May 1, 1909. No. 5790 D.

See also Curves, under PERMANENT WAY AND BUILDINGS; and Motor Cars, under MOTIVE POWER AND EQUIPMENT.

Train Sheds.

Bush Train Shed at Scranton. Illustrated description, with a statement of the advantages of these sheds. 1000 w. R R Age Gaz—March 19, 1909. No. 3291.

Transfer Tables.

A Railway Transfer Table Without a Pit. Henry V. Miller. Illustrated description of a table recently built for the Southern Pacific Co., at Sacramento, Cal. 1200 w. Eng News—July 15, 1909. No. 6383.

Tunnels.

The East Side Tunnel and Its Approaches, Providence, R. I. Edwin P. Dawley. An illustrated description of this work in connection with the improved terminal facilities. 9500 w. Jour Assn of Engng Socs—May, 1909. No. 6351 C.

RAILWAY ENGINEERING

Tunnels

Long Railway Tunnels. Construction, Ventilation and Operation. Francis Fox. On the great town tunnels in Great Britain, giving history and illustrated description. 19200 w. Bul Int Ry Cong—Aug., 1909. No. 8027 G.

See also same title, under CIVIL ENGINEERING, CONSTRUCTION; Track Construction, under PERMANENT WAY AND BUILDINGS; and Tunnels, under CIVIL ENGINEERING, CONSTRUCTION.

Tunnel Ventilation.

The Ventilation of Tunnels (Aération des Souterrains). A general review of tunnel-ventilation methods, with reference to the Présailles tunnel of the Paris-Lyon-Mediterranean Railway. 11500 w. Ann d Ponts et Chaussées—1909-IV. No. 7909 E + F.

A Study of Tunnel Ventilation (Studi delle Ferrovie dello Stato sulla Ventilazione delle Gallerie). An illustrated account of a study made by the Italian state railways. Serial. 1st part. 4000 w. Ing Ferro—Dec. 1, 1908. No. 1938 D.

Turning Y's.

The Employment of Turning Y's for Locomotive (L'Emploi de Circuits à Rebroussements pour le Tournage des Locomotives). M. Goupil. Describes various track arrangements for locomotives too long to be handled on turntables. Ills. 2000 w. Ann d Ponts et Chauss—1908-V. No. 2611 E + F.

Washouts.

Railway Slides and Washouts. Abstract of a circular issued by the Roadway Com-

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Car Interchange

mittee of the Am. Ry. Engng. & Main. of Way Assn. Causes and remedies are discussed. 1500 w. Eng News—Dec. 10, 1908. No. 940.

Yard Accidents.

Yard Damage Preventives. Charles Burlingame. Suggests remedies found to give good results in lessening terminal yard accidents. 7500 w. Pro St. Louis Ry Club—July 9, 1909. No. 7017.

Yards.

The Gardenville Yard of the New York Central Lines. Plan and description of this freight terminal near Buffalo, N. Y. 2500 w. Eng Rec—Nov. 7, 1908. No. 137.

Gary Classification Yard of the Chicago, Lake Shore & Eastern. Gives plan and brief description of the 15000 car classification yard at Gary, Ind., and the new shop plant. 700 w. R R Age Gaz—Jan. 8, 1909. No. 1649.

Electric Installations in the Wustermark Distributing Yard (Die elektrischen Anlagen des Verschiebebahnhofes Wustermark). Herr Meyer. Describes the power plant, the uses to which the power is put, the lighting, etc. Ills. 3500 w. Elek Kraft u Bahnen—June 14, 1909. No. 6712 D.

The Renens Classification Yard (Etude sur la Gare de Triage de Renens). T. Balmer. Describes the yard and the method of distributing and making up trains. Ills. 4000 w. Bul Tech d l Suisse Romande—July 10, 1909. No. 7223 D.

See also Car Haulage, under MOTIVE POWER AND EQUIPMENT.

TRAFFIC

Car Carding.

Carding of Cars. J. E. Stumpf. Read before the Cent. Assn. of R. R. Officers. Discusses the form of cards to be used, their color, etc. 800 w. R R Age Gaz—Nov. 6, 1908. No. 134.

Car Distribution.

Car Distribution and Car Shortage. Report of Franklin K. Lane before the Nat. Assn. of Ry. Com. Discusses remedies for car shortage, etc. 3000 w. Ry & Engng Rev—Nov. 7, 1908. No. 160.

Coal Car Distribution. Arthur Hale. A discussion of the difficulties in properly handling coal cars, with explanation of the present situation and the private car

question. 6000 w. R R Age Gaz—Sept. 17, 1909. No. 7800.

Mine Inspection with Respect to Car Allotment. H. B. Douglas. Read before the Coal Min. Inst. of America. Discusses the proper method of mine rating, and matters relating to car distribution. 2500 w. Eng & Min Jour—July 3, 1909. No. 6170.

Car Efficiency.

A. R. A. Report on Car Efficiency. Extracts from the report presented May 19, at the New York meeting. 2000 w. R R Age Gaz—May 28, 1909. No. 5049.

Car Interchange.

Report of Committee of the Railway Club of Pittsburgh on Revision of M. C.

RAILWAY ENGINEERING

Combinations

B. Rules of Interchange. Gives the changes recommended, with discussion. 10000 w. Pro Ry Club of Pittsburgh—March 26, 1909. No. 4527 C.

Freight-Car Distribution in the Prussian State Railways Car Association (Die Güterwagenverteilung im preussischen Staatsbahnwagenverbande). Herr Grunow. Describes the method of car interchange. Ills. Serial. 1st part. Glaser's Ann—March 1, 1909. No. 4273 D.

Combinations.

Railway Combinations from the Trader's Point of View. Alfred Mond. From report of the Board of Trade Railway Conference. The effects of combination are considered. 2500 w. Ir & Coal Trds Rev—June 18, 1909. No. 6055 A.

Commodity Clause.

Testing the Constitutionality of the Commodity Clause. Reviews the brief in behalf of the railways, and the arguments of the counsel for the government. 3500 w. R R Age Gaz—Feb. 12, 1909. No. 2473.

Demurrage.

Uniform Demurrage Rules. Extracts from an address by John H. Marble before the convention of the Grain Dealers Nat. Assn. 2000 w. R R Age Gaz—Oct. 22, 1909. No. 8816.

Reciprocal Demurrage. Arthur Hale. Address before the R. R. committees of the Nebraska Legislature. 1200 w. R R Age Gaz—Feb. 12, 1909. No. 2471.

Reciprocal Demurrage. F. O. Melcher. A memorandum submitted to the R. R. Committee of the Iowa Senate opposing the adoption of a reciprocal demurrage bill. 2000 w. R R Age Gaz—March 26, 1909. No. 3515.

The Private Freight Car and Demurrage. A discussion of the relation of the private car problem to the demurrage question. 3000 w. R R Age Gaz—Aug. 27, 1900. No. 7401.

Handling Merchandise Shipments from Chicago to the South and Southeast. Samuel O. Dunn. Explains the conditions and methods introduced to secure better service. Map. 2500 w. R R Age Gaz—March 5, 1909. No. 3035.

Explosives.

Safe Handling and Transportation of Explosives and Inflammables. Col. B. W. Dunn. Gives an idea of the extent of this Business Administration. 2200 w. R R of regulations wisely enforced. Ills. 10500 w. Pro Ry Club of Pittsburgh—Dec., 1908. No. 2098 C.

TRAFFIC.

Freight Offices

The American Railway Association's Bureau for the Safe Transportation of Explosives and Other Dangerous Articles. Col. B. W. Dunn. A sketch of the origin work, and its possible lines of development. 5500 w. Pro N Y R R Club—Feb. 19, 1909. No. 2099.

Transportation of Dangerous Articles. Railway Officials' Responsibilities and Duties. Col. B. W. Dunn. On the work of the Bureau of Explosives in connection with the transportation of dangerous articles. Also discussion. 10000 w. Pro Cent Ry Club—Sept. 10, 1909. No. 8520 C.

Formulae.

A Method of Studying Traffic Formulae for the Exploitation of Railways of Local Interest (Note sur un Procédé d'Etude des Formules d'Exploitation pour les Chemins de Fer d'Intérêt local). M. Tourtay. Mathematical discussion. Ills. 2500 w. Ann d Ponts et Chaussées—1909-III. No. 7214 E + F.

Freight.

Traffic Studies. Ray Morris. This first article of a series deals with the traffic on the lines of the Oregon Railroad & Navigation Company. 2800 w. R R Age Gaz—May 7, 1909. Serial. 1st part. No. 4561.

Freight Handling on the Metropolitan Division of the Toronto and York Radial Railway. Describes the physical characteristics of this line, the equipment and methods. Ills. 2500 w. Elec Ry Jour—July 3, 1909. No. 6098.

Freight Claims.

Freight Claim Departments. W. L. Schneider. Gives a summary of the present manner of handling unclaimed freight, and suggests improvements. 1800 w. R R Age Gaz—June 25, 1909. No. 5887.

Freight Classification.

Uniform Classification. Samuel O. Dunn. Gives a brief history of the efforts made to frame a uniform classification for freight, including the latest attempt. 2500 w. R R Age Gaz—Sept. 3, 1909. Serial. 1st part. No. 7587.

Freight Handling.

Freight-Handling Equipment. Werner Broecklin. Illustrates and describes interesting methods of mechanical handling and suggests possible extensions. 2500 w. Engineering Magazine—July, 1909. No. 5975 B.

Freight Offices.

Local Freight Office Efficiency, from the Viewpoint of the General Freight Office.

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Freight Rates

Charles R. French. Discusses matters that affect the efficiency and service. 3500 w. R R Age Gaz—March 5, 1909. Serial. 1st part. No. 3036.

Freight Rates.

Railway Rate Making in Practice. William Z. Ripley. Discusses problems to be solved in the development of a rate sheet. Diagrams. 3300 w. R R Age Gaz—May 7, 1909. Serial. 1st part. No. 4560.

Transcontinental Freight Rates. Editorial discussion of the charges against the present system, and the possible remedies. 3500 w. R R Age Gaz—May 14, 1909. No. 4656.

Railway Freight Rate Making. Samuel O. Dunn. A lecture at the Univ. of Illinois. Discusses the factors that determine rates and conditions affecting them. 6000 w. R R Age Gaz—Aug. 6, 1909. No. 6918.

Construction of Freight Rates in the South. J. M. Culp. Lecture at Harvard Univ. Discusses the factors that influenced rate evolution in the south. 3800 w. Ry & Engng Rev—Aug. 7, 1909. No. 6956.

Shall Rates in the West Be Based on Distance or on Industrial and Commercial Conditions? Editorial discussion. 2500 w. R R Age Gaz—Oct. 8, 1909. No. 8447.

Co-operative Freight Traffic. Alfred H. Post. Address before the Cincinnati Branch Nat. Metal Trds. Assn. 2000 w. Ir Age—March 18, 1909. No. 3214.

Freight Traffic.

Note on the International Convention for the Carriage of Goods on Railways, of 14 October, 1890. L. Calmar. Discussion of proposed reforms in Europe. 11000 w. Bul Int Ry Cong—Aug., 1909. No. 8029 G.

I. C. C. Decisions.

The Dockets of the Interstate Commerce

MISCELLANY.

Commission. Logan G. McPherson. Gives a summary of complaints presented for the 15 months beginning Jan. 1, 1908, and ending March 31, 1909. 2800 w. R R Age Gaz—July 23, 1909. No. 6630.

Mail Carrying.

Railway Mail Pay. Julius Kruttschnitt. Reviews legislation and reduction of rates during the last ten years, giving receipts and other information. 3500 w. R R Age Gaz—April 9, 1909. Serial. 1st part. No. 3846.

Mineral Products.

See Transportation, under MINING AND METALLURGY, MISCELLANY.

New York.

Freight Distribution by Subway. Briet illustrated description of a system proposed for New York City. 1500 w. Sci Am—Dec. 5, 1908. No. 818.

Passenger Rates.

The Passenger Rate of the American Railway. William S. Bronson. This first article of a series gives an explanation of the rates of fare generally in use. 1700 w. R R Age Gaz—May 28, 1909. Serial. 1st part. No. 5048.

Review.

Review of Traffic Questions. C. Colson. The results of working the railways during 1906 in France, England, Germany and the United States; the situation in 1907. 2200 w. Bul Int Ry Cong—Nov., 1908. No. 898 G.

Tariffs.

Railway Tariffs, Their Compilation, Filing and Inspection. Discusses critically the filing devices and filing systems in use, especially the system in use on the Harriman lines, and the Cook system. 5500 w. R R Age Gaz—Aug. 27, 1909. No. 7400.

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Accounting.

Railroad Accounting and the Hepburn Law. Arthur C. Graves. Brief review of the recent railway reports and the information given, with an examination of the provisions of the Hepburn Act. 1500 w. R R Age Gaz—Dec. 11, 1908. Serial. 1st part. No. 925.

Africa.

The Railways of French North Africa. Edgar Allen Forbes. An illustrated

article describing the lines, rolling stock, and management. 3000 w. Engineering Magazine—March, 1909. No. 2785 B.

Alaska.

Railroads of the Copper River District, Alaska. H. S. Taylor. Map and description of the various projects, the region, and the development work. 2500 w. Min Wld—May 15, 1909. No. 4698.

Apprenticeship.

Student Employees on the Harriman

RAILWAY ENGINEERING

Arabia

Lines. Interesting description of the method of training young men for positions in the operating departments. Gives abstract of curriculum. 3500 w. R R Age Gaz—June 4, 1909. No. 5287.

Arabia.

The Hedjaz Railway (Die Hedschasbahn). Herr Denicke. Describes the line, rolling stock, etc. Ills. 4000 w. Glaser's Ann—Feb. 15, 1909. No. 3395 D.

The Hedjaz Railway (Die mohammedanische Eisenbahn, Hedschasbahn). E. A. Ziffer. A brief general description of the line, rolling stock, etc. Ills. 4500 w. Mitt d Ver f d Förd d Lokal und Strassenbahnwesens—June, 1909. No. 7254 F.

Asia.

Railroad Building in Asia. John Foord. Interesting account of the active development now under way, and the influences which have brought the present situation. 5000 w. Ir Age—Sept. 2, 1909. No. 7515.

Associations.

Work of the American Railway Association. W. F. Allen. From an address on "Railway Operating Associations," delivered before the Harvard School of business, accounts of accidents, and need Age Gaz—Jan. 22, 1909. Serial. 1st part. No. 2002.

Australia.

A Utopian Railway Project. Robert W. Wilson. An explanation of the railway situation in Australia. 1500 w. R R Age Gaz—April 9, 1909. No. 3847.

Government Railways in Australia. G. H. Knibbs. Discusses the desirability of improved statistics. 1300 w. Aust Min Stand—March 24, 1909. Serial. 1st part. No. 4513 B.

Boston.

Report of the Boston Metropolitan Improvements Commission. Gives the recommendations of the commission of a proposed development of the present steam railway systems of the Boston terminal district. Ills. 3000 w. R R Age Gaz—April 23, 1909. No. 4155.

British Columbia.

The Railways of British Columbia. Brief reports of progress on the Grand Trunk Pacific, Canadian Pacific, and Canadian Northern. 2500 w. R R Age Gaz—April 2, 1909. No. 3739.

Canada.

Transport and Canadian Development. Editorial, with map, on the importance of transport facilities in the development of

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the country. 2000 w. Engng—Oct. 15, 1909. No. 8932 A.

C. C. & O. R. R.

The Costliest Railroad in America. J. O. Lewis. Illustrations and brief description of the Carolina, Clinchfield & Ohio Railroad that cost more than thirty million dollars. 2000 w. Sci Am Sup—July 31, 1909. No. 6766.

China.

The Railways of China. Information concerning the actual construction and lines projected, with statement of the nations furnishing the capital and responsible for the management of the railways after construction. Map. 2200 w. Engr, Lond—March 12, 1909. No. 3423 A.

Railway Development in China. Arthur John Barry. Briefly outlines the history of the railway movement in China, showing the obstacles that had to be overcome, describing the railways constructed and giving interesting information. General discussion. 15000 w. Jour Soc of Arts—May 21, 1909. No. 5203 A.

Railway Development in China. R. C. Hardman. Outlines present means of transportation, what has been done toward the development of a railway system, and the outlook for expansion in the future. Ills. 3300 w. Transit—June, 1909, No. 6480 N.

Colombia.

The Dorada Railway Extension in Colombia. An explanation of conditions and of the inaccessible locations chosen for the capital cities of South America, and an illustrated description of an extension of 50 miles recently constructed to connect Cambao with Honda. 1800 w. Engr, Lond—March 12, 1909. No. 3426.

Costa Rica.

Railroad Construction and Harbor Work in Costa Rica. Substance of a paper by William D. Janney, read before the Engineers' Club of Baltimore, describing the construction of a railroad and improvement of harbor facilities. Ills. 2000 w. Eng Rec—March 20, 1909. No. 3272.

Earning Power.

The Earning Power of Leading Railways. F. E. Voegelin. Analyses of 22 systems, covering the years from 1899-1908. 3000 w. R R Age Gaz—Aug. 6, 1909. No. 6921.

Education.

Practical Education for Railroad Service. L. H. Turner. Gives the author's views in regard to the aim of practical

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England

education. Followed by general discussion. 14500 w. Pro Ry Club of Pittsburgh—May 28, 1909. No. 6357 C.

English Railways.

English Railways. William Wickham Turlay. Begins a study of features of English railways, considering in the present article the protection from accidents. 1100 w. R R Age Gaz—May 7, 1909. Serial. 1st part. No. 4563.

The Position of English Railways. W. M. Acworth. Reprinted from *North American Review*. Gives an outline of the present position, showing the change a half century has brought, and comparing railway conditions in the United States and England, with discussion of state ownership and related matters. 3500 w. R R Age Gaz—Sept. 24, 1909. No. 8046.

The Railway Situation. Editorial review of the returns of the English railway companies for the second half of 1908, and matters related. 2200 w. Engng—Feb. 26, 1909. No. 3067 A.

Presidential Address of James Charles Inglis, before the Institution of Civil Engineers. Discusses the question of transport, especially the work of Isambard Kingdom Brunel. 10000 w. Engng—Nov. 6, 1908. No. 325 A.

Railway Facilities in North-East Anglia. An explanation of the problem arising from the proposed amalgamation of the Great Northern, Great Central, and Great Eastern railways. 2000 w. Engr, Lond—Oct. 30, 1908. No. 198 A.

The London and North-Western Railway and Crewe Works. A review of the history and detailed description of the principal features. Plates and Ills. 21000 w. (Sup.) Engr, Lond—Dec. 11, 1908. No. 1221 A.

The Camerton and Limpley Stoke Railway. Illustrated description of a branch line of the Great Western Ry. Co., built mainly on the bed of the old Somersetshire Coal Canal. 1200 w. Engr, Lond—Feb. 5, 1909. No. 2490 A.

Newburgh and North Fife Railway. Illustrated detailed description of a line 12 miles, 69 chains in length, having 43 bridges and culverts. 1500 w. Engr, Lond—July 23, 1909. No. 6859 A.

Exposition.

International Railway and Land Transport Exposition in Buenos Aires, May-Nov., 1910 (Exposicion internacional de Ferrocarriles y Transportes terrestres en Buenos Aires Mayo-Noviembre de 1910). An official prospectus, giving programme,

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German West Africa

classification of exhibits, entry charges, and regulations for the guidance of exhibitors. 7000 w. Anales d l Soc Cien Argentina—Jan., 1909. No. 7251 E + F.

Finland.

The Railways and Waterfalls of Finland. Illustrated description of the waterways, and of the improvements carried out by the State. Maps. 4500 w. Engr, Lond—Sept. 17, 1909. No. 8130 A.

France.

Lines of Local Interest in France. C. Colson. Discusses the French local railways and rural tramways in 1907, the urban railways and tramways, and the proposed French statute concerning lines of local interest. 7500 w. Bul Int Ry Cong—Feb., 1907. No. 3282 G.

The Redemption of the Lines of the Western Railway of France and Their Organization for State Operation (Le Rachat du Réseau des Chemins de Fer de l'Ouest et l'Organisation de son Exploitation par l'Etat). P. Maurice. Serial. 1st part. 4500 w. Génie Civil—Feb. 13, 1909. No. 3341 D.

The Legislation Affecting the Lines of Local Interest (Note sur la Législation des Voies Ferrées d'Intérêt local). A. Doniol. A discussion of the recent law. 12000 w. Rev Gen des Chemins de Fer—Feb., 1909. No. 3324 G.

The Construction of Railways in Department of the Cher (Notice sur la Construction des Chemins de Fer départementaux du Cher). M. Mayer. Reviews the financial, traffic and engineering problems connected with building 165 kilometres of lines of local interest in this part of France. Ills. 16000 w. Ann d Ponts et Chaussées—1909-I. No. 4811 E + F.

French West Africa.

The Railways of French West Africa (Note sur les Chemins de Fer de l'Afrique occidentale française). R. Godfernaux. Exhaustive description of the Dakar-Saint Louis line and equipment. Ills. 7500 w. Rev Gen des Chemins de Fer—Sept., 1909. No. 8613 G.

German West Africa.

The Lüderitzbucht-Keetmanshoop Railway in German Southwest Africa (Die Bahn von Lüderitzbucht nach Keetmanshoop in Deutsch-Südwestafrika). Herr Friedrich. Illustrated description of the line, rolling stock, construction work, etc. 5000 w. Glaser's Ann—March 15, 1909. No. 4276 D.

RAILWAY ENGINEERING

Government Control

Government Control.

The Railways and the People. Frank Trumbull. From an address before the Board of Trade of Fort Worth, Texas. Discusses regulation of rates, over-capitalization, etc. 2000 w. R R Age Gaz—Feb. 19, 1909. No. 2546.

Public Regulation and Control of Railways. Frederic A. Delano. An address before the Hannibal (Mo.) Commercial Club. Considers present conditions of railway business, and discusses the remedies suggested. 3500 w. R R Age Gaz—April 16, 1909. No. 3982.

Government Ownership.

The Nationalization of Railways. C. S. Vesey Brown. Discusses the practical workings of state ownership in various countries. 3500 w. Cassier's Mag—Dec., 1908. No. 947 B.

Railway Nationalization. Sir George Gibb. Read at meeting of the Royal Economic Society, London. Discusses the various phases of this subject. 3500 w. R R Age Gaz—Dec. 4, 1908. Serial. 1st part. No. 806.

History.

The Centenary of Railroad Travel. W. B. Paley. Concerning Richard Trevithick's experiments, one-hundred years ago. 1000 w. R R Age Gaz—Nov. 6, 1908. No. 132.

India.

A Railway to India. C. E. D. Black. Map and discussion of a projected line through Northern Arabia and Southern Persia, connecting Egypt and India. 3000 w. Nineteenth Cent—Jan., 1909. No. 1838 D.

Light Railways in India. Percy F. Martin. The present article shows the need of short branch railways, explains the conditions, and matters relating to the problems of their construction. 2500 w. Engr, Lond—April 23, 1909. Serial. 1st part. No. 4466 A.

Indo-China.

The Railways of Indo-China (Note sur les Chemins de Fer de l'Indo-Chine). R. Godfernaux. Describes the lines, rolling stock, buildings, economic conditions, etc. Ills. Serial, 1st part. 9500 w. Rev Gen des Chemins de Fer—June, 1909. No. 6532 G.

Ireland.

The Bray and Wicklow Railway. Illustrated description of this railway on the Irish coast, where the encroachments of

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Management

the sea causes great expense. 1500 w. Engr, Lond—July 9, 1909. No. 6429 A.

Italy.

The Development of Railways in Italy in Relation to the National Economic Development (Lo Sviluppo delle Strade ferrate in Italia esaminato in Relazione al Progresso economico nazionale). A. Gulini. Ills. Serial. 1st part. 8000 w. Ing Ferro—April 16, 1909. No. 4850 D.

Java.

The Railways of Java (Die wirtschaftlichen Eisenbahnen auf der Insel Java). E. A. Ziffer. A brief general description. Ills. 2500 w. Mitt d Ver f d Förd d Lokal u Strassenbahnwesens—July, 1909. No. 7255 F.

Long Island.

The Long Island. Editorial review of conditions of a road whose business is largely suburban service, and of the means being tried to put the road on a profitable basis. 1200 w. R R Age Gaz—May 14, 1909. No. 4657.

Management.

Organization. A description of the organization of the motive power department of the Lake Shore & Michigan Southern Railway. An important study. 12500 w. Am Engr & R R Jour—Dec., 1908. No. 846 C.

Organization. H. Wade Hibbard. Discusses organization conducive to harmonious action in railway management. 4500 w. Pro St. Louis Ry Club—April 9, 1909. No. 4543.

Methods of the Santa Fe. Efficiency in the Manufacture of Transportation. Charles Buxton Going. The first of a series of articles designed to give a broad view of the Santa Fe problem affecting the manufacture of transportation, and of the policy underlying the work. Ills. 4000 w. Engineering Magazine—March, 1909. Serial, 1st part. No. 2782 B.

Methods of the Santa Fe. Efficiency in the Manufacture of Transportation. Charles Buxton Going. This second article of a series considers the stores-keeping, shop-order and works-order systems. Ills. 4000 w. Engineering Magazine—April, 1909. No. 3523 B.

Methods of the Santa Fé. Efficiency in the Manufacture of Transportation. Charles Buxton Going. This third article of a series deals with the manufacturing policies for the economical maintenance of motive power. Ills. 4000 w. Engineering Magazine—May, 1909. No. 4344 B.

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Methods of the Santa Fé: Efficiency in the Manufacture of Transportation. Charles Buxton Going. This fourth article of a series deals with the administration, supervision and extension of the bonus system. 5000 w. Engineering Magazine—June, 1909. No. 4984 B.

Methods of the Santa Fe. Efficiency in the Manufacture of Transportation. Charles Buxton Going. Fifth and last article of a series, discussing the apprenticeship system and relations with employees. Ills. 5000 w. Engineering Magazine—July, 1909. No. 5973 B.

The Successful Mechanical Department Official. Fundamental principles underlying an efficient organization. Discussion and comment. 2700 w. Am Engr & R R Jour—June, 1909. No. 5328 C.

Suggested Possibilities of Supply Department Management. George G. Yeomans. Gives a comparison of the amount of material and supplies in stock on different railways and analysis of conditions that should determine the amount of stock to be carried. 3500 w. R R Age Gaz—July 30, 1909. No. 6781.

The Operating Organization of the Union Pacific and Southern Pacific Systems. Julius Kruttschmitt. From a paper read before the N. Y. R. R. Club. Gives a chart showing in detail the organization, giving also full particulars and statistics. Inset. 7000 w. R R Age Gaz—May 28, 1909. No. 5046.

See also Education, under INDUS-TRIAL ECONOMY.

Mexico.

Railway Policy and Operation in Mexico. An explanation of the government policy and the changes in methods of operation. 1600. R R Age Gaz—July 2, 1909. No. 6125.

The Railroad Systems of Northern Mexico. H. A. Horsfall. Map and discussion of the railroads in operation and under construction. 1500 w. Eng & Min Jour—April 3, 1909. No. 3728.

What the Southern Pacific Will Do for Mexico. Eugene A. H. Tays. Gives information in regard to the railway facilities, explaining the nature of the Mexican people, and giving reasons for prophesying great benefits to the country and company. 2000 w. Min Wld—July 3, 1909. No. 6140.

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The First Railway in Montenegro (La Prima Ferrovia nel Montenegro). A. Baldacci. Describes the line and discusses its economic importance. Ills. 5000 w. Riv Marit—Oct., 1908. No. 537 E + F.

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The Christiania-Bergen Railway. Ole W. Lund. History and illustrated description of a line constructed through difficult country; remarkable for the height to which it rises, the severe climate and enormous masses of snow, and the number of tunnels. 3300 w. R R Age Gaz—July 30, 1900. No. 6782.

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N. Y., N. H. & H.

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The Working of the Railways in the South African War. W. Hyde Kelly. On the organization and work of a military railway staff. 4000 w. Engng—Jan. 15, 1909. No. 2079 A.

Southern Pacific.

Twenty-fourth Annual Report of the Southern Pacific Company and Proprietary Companies for the fiscal year ended

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Statistical Charts

June 30, 1908. Report, with editorial review. 8500 w. R R Age Gaz—Feb. 12, 1909. No. 2470.

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Railway Development in Turkey (Les Chemins de Fer en Turquie). Louis Godard. A review of existing and projected lines. Ills. 4800 w. Génie Civil—July 3, 1909. No. 7228 D.

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Review of 1908. Annual Reports. Ray Morris. Review by means of a graphic diagram with explanatory notes. 1500 w. R R Age Gaz—Dec. 25, 1908. No. 1289.

Twenty-Second Annual Report of Interstate Commerce Commission. Extracts from the report transmitted to Congress Jan. 11. 3500 w. R R Age Gaz—Jan. 15, 1909. No. 1790.

The Railroad Situation of To-day. Frank Trumbull. Discusses the problem of how to settle satisfactorily the relations between private capital and the users of American railroads. 4500 w. Jour W Soc of Engrs—Feb., 1909. No. 3297 D.

Railroad Building Essential to National Growth. W. J. Meany. Gives B. F. Yoakum's view of the transportation necessities of the country, giving statistics. 2500 w. Mfrs' Rec—Oct. 7, 1909. No. 8384.

The Relation of Railways to Canals. John F. Stevens. A general outline of the conditions in the United States. 3000 w. Yale Sci M—Oct., 1909. No. 8766 C.

Southern Railroads and Their Needs. John F. Wallace. Extract from an address before the Southern Commercial Congress. 2500 w. Ry & Engng Rev—Dec. 19, 1908. No. 1063.

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Railroads in the Upbuilding of the South. W. J. Meany. A general review of what has been accomplished, especially recent important roads, and the future needs. 5000 w. Mfrs Rec—Jan. 7, 1909. (Special No.) No. 1560 C.

Problems Fronting Railroads in South Atlantic States. J. T. Odell. Discusses

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the railroad situation in the South, the need for improvement and modernization. 2200 w. Mfrs Rec—Jan. 7, 1909. (Special No.) No. 1559 C.

Valuation.

Railway Capital and Values. W. H. Williams. Extracts from a paper before the Traffic Club of New York. A study of methods of valuation and results in the state of Michigan. 1500 w. Ry & Engng Rev—Dec. 26, 1908. No. 1283.

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The Valuation of Railways. Considers some of the benefits that may be expected to result from valuation, and some of the difficulties. 4500 w. R R Age Gaz—Jan. 22, 1909. Serial, 1st part. No. 2003.

Some Neglected Factors of Fair Valuation. Editorial on the desirability of considering other factors than the cost of reproduction. 1800 w. R R Age Gaz—March 5, 1909. No. 3029.

Valuation of Railways in Minnesota. Gives the results of an exhaustive physical valuation, explaining methods used. Also editorial. 6000 w. R R Age Gaz—Feb. 5, 1909. No. 2301.

Appraisal of the Physical Properties of Railroads of Minnesota. Extracts from report of Dwight C. Morgan. Explains the general plan for estimating values, means of securing data, etc. 9500 w. Ry & Engng Rev—March 13, 1909. No. 3137.

An Analysis of the Appraisal of the Railways of Minnesota with Comments on the Same. A review of the report of Dwight C. Morgan to the Railroad and Warehouse Commission of Minnesota. 4000 w. Engng-Con—March 3, 1909. No. 3027.

The Work of the Joint Engineering Staff of the Wisconsin Tax and Railroad Commission. William D. Pence. An account of the valuation work. Discussion. 15000 w. Jour W Soc of Engrs—Feb., 1909. No. 3299 D.

Report of H. P. Gillette to the Washington Railroad Commission on the valuation of the railways in Washington. 5000 w. Engng-Con—April 7, 1908. Serial. 1st part. No. 3872.

Welfare Work.

Saloons versus Railway Clubs on the Harriman Lines. F. G. Athearn. Illus-

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Western Railroad Ass'n

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Association to Railways and the Manufacturers of Railway Devices. George S. Payson. Address and discussion on railway patents. 9000 w. Pro W Ry Club—Sept. 21 1909. No. 8740 C.

STREET AND ELECTRIC RAILWAYS

Accounting

Accounting.

The Accounting Department. W. B. Wright. Abstract of paper describing organization and routine of the accounting department, its relation to other departments, and the duties of its chief. Read before Central Elec. Ry. Association. 2500 w. Elec Ry Jour—June 5, 1909. No. 5255.

Electric Railway Accounting. A. L. Linn, Jr. Abstract of paper before the St. Ry. Assn. of the State of N. Y. A study based on usage of the uniform system prescribed by the Public Service Commission of the Second District. Also discussion. 5000 w. Elec Ry Jour—July 3, 1909. No. 6100.

The Audit of the Accounts of Tramway Undertakings and Tramway Finance Companies. Outlines some of the important matters in relation to the auditor's duty, and some points that appear in tramway finance. 3000 w. Elec Rev, Lond—Sept. 24, 1909. Serial. 1st part. No. 8343 A.

Adelaide, Australia.

Adelaide Electric Tramways. Description of a modern plant and system operated by a municipal trust. Ills. 5500 w. Aust Min Stand—April 28, 1909. No. 5458 B.

Adhesion System.

See Switzerland, under STREET AND ELECTRIC RAILWAYS.

Austria.

The Rittner Railway in the Tyrol (Die Rittnerbahn, Tirol). Egon E. Seefehlner. Illustrated detailed description. Serial. 1st part. 2800 w. Elek Kraft u Bahnen—Oct. 14, 1908. No. 591 D.

Bombay.

The Tramways of Bombay. Illustrated detailed description of the system as converted to electric traction. 3000 w. Tram & Ry Wld—July 8, 1909. No. 6605 B.

Boston.

Report of the Boston Metropolitan Improvement Commission. Abstract of a report particularly considering transpor-

Brooklyn Bridge

tation problems. Also editorial. 6000 w. Eng News—April 1, 1909. No. 3763.

Brakes.

Report of the Tramways and Light Railways Association Committee on "Braking Arrangements and Sanding Gear on Tram Cars." 5000 w. Elect'n, Lond—Nov. 13, 1908. Serial. 1st part. No. 438 A.

Brakes for Electric Tram Cars. Edgar Harry Cockshott. Describes investigations carried out to ascertain the reliability of brakes in use under adverse conditions, and to devise, if possible, a new brake of greater efficiency. 5500 w. (Abridged.) Inst of Civ Engrs—No. 3752. No. 882 N.

Improvement in the Upkeep of the Braking Equipment of Trams. P. Scholtes. Translation of a report of the replies received to questions sent out. 2500 w. Elect'n, Lond—Feb. 5, 1909. No. 2477 A.

Braking.

The Overloading of Tramway Cars (I Sovraccarichi delle Vetture tramviarie Considerati nei Riguardi della Sicurezza dell' Esercizio). Guido Vallecchi. A consideration of safety in operating electric cars with particular reference to brakes. Ills. 5000 w. Ing Ferro—Jan. 1, 1909. No. 2654 D.

Brooklyn.

The Line and Track Department Headquarters of the Brooklyn Rapid Transit System. I. General Features of Arrangement and Construction. The present article illustrates and describes architectural and constructional features. 3500 w. Elec Ry Jour—Dec. 5, 1908. Serial. 1st part. No. 799.

Brooklyn Bridge.

Traffic on the Brooklyn Bridge, New York City. F. van Z. Lane. Considers features of the traffic as an example of high-class operation when traffic density, capacity, safety, comfort, speed and reliability are considered. Deals with the evening rush hour, from 5 to 6 p. m. Plate. 3000 w. R R Age Gaz—March 2, 1909. No. 3096.

STREET AND ELECTRIC RAILWAYS

Canal Traction

Canal Traction.

Electric Haulage on Canals. Extract translated from an article by Dr. G. Meyer, referring to recent developments. 1200 w. Elec Rev, Lond—July 9, 1909. No. 6419 A.

Electric Canal Haulage (Der elektrische Schiffszug). Georg Meyer. An exhaustive discussion of the various systems. Ills. 13000 w. Elek Kraft u Bahnen—Nov. 14, 1908. No. 1178 D.

Eleventh International Navigation Congress, St. Petersburg, 1908 (XI^e Congrès international de Navigation tenu à Saint-Petersbourg en 1908). Report of the discussion on canal traction. 8000 w. Ann d Ponts et Chaussées—1909-IV. No. 7913 E + F.

Electrical Haulage of Canal Boats (La Traction électrique des Bateaux sur les Canaux). P. du Bousquet. A discussion of its advantages and disadvantages, reviewing experiences and tests on various European canals. Ills. 11200 w. Mem Soc Ing Civ de France—Nov., 1908. No. 2605 G.

Electric Haulage of Canal Boats (Hal age électrique des Bateaux). Léon Gerard. A discussion of M. du Bousquet's paper, referring principally to the results of the Lehigh Canal tests. Ills. 4400 w. Mem Soc Ing Civ de France—May, 1909. No. 6503 G.

Car Barns.

Large New Car House of Chicago City Railway. Illustrated detailed description of the constructional features. 3500 w. Elec Ry Jour—May 8, 1909. No. 4536.

Street Railway Car House Design and Operation. H. B. Fleming. Abstract of paper presented at a joint meeting of Western Society of Engineers and Chicago Section American Institute of Electrical Engineers, Chicago, May 28. 1800 w. Elec Ry Jour—June 5, 1909. No. 5258.

See also same title, under MECHANICAL ENGINEERING, HEATING AND COOLING; and Fire Protection, under CIVIL ENGINEERING, WATER SUPPLY.

Car Bearing Friction.

Bearing Friction and Power Consumption. M. V. Ayres. A study of the saving that may be accomplished by reducing bearing friction. 2000 w. Elec Ry Jour—Aug. 21, 1909. No. 7162

Car Fenders.

Car Fender and Wheelguard Tests. Recommendations and report of experience with various types in the tests re-

Cars

cently made by the N. Y. Public Service Commission. 4000 w. Eng News—Feb. 25, 1907. No. 2759.

Fender and Wheelguard Tests of the Public Service Commission of New York, First District. Abstract of the report of tests made for the Commission. 4000 w. Elec Ry Jour—Feb. 6, 1909. No. 2288.

Street Car Fenders and Wheel Guards. An account of the tests by the Public Service Commission. Ills. 2500 w. Munic Jour & Engr—Feb. 10, 1909. No. 2383.

Car Inspection.

The Reduction of Equipment Failures and Maintenance Cost on the Third Avenue Railroad System, New York. Gives results of improvement due mainly to weekly inspection. 1500 w. Elec Ry Jour—Feb. 20, 1909. No. 2534.

Car Maintenance.

Methods and Costs of Inspection and Repair Work on the South Side Elevated Railroad. An effective record system used in Chicago is described and some figures of cost given. 2500 w. Elec Ry Jour—April 3, 1909. No. 3667.

Piece-Work Rates Used by the Third Avenue Railroad Company, New York. Explains the use of this system for car-maintenance work, giving rates for different contracts. 2000 w. Elec Ry Jour—May 15, 1909. No. 4651.

Rolling Stock Standardization in Brooklyn—Records and Forms. Explains the use of the record system in car maintenance, the bases of inspection and repair, etc. 3500 w. Elec Ry Jour—May 29, 1909. Serial. 1st part. No. 5000.

Mechanical and Electrical Practices at Harrisburg, Pa. Illustrated description of features of maintenance practice. 3000 w. Elec Ry Jour—April 3, 1909. No. 3666.

See also Shops, under STREET AND ELECTRIC RAILWAYS.

Cars.

New Standard Car for the Metropolitan Street Railway, New York. An account of investigations made to determine the best type to meet conditions, with illustrated description of the car adopted and its equipment. 2500 w. Elec Ry Jour—Dec. 5, 1908. No. 800.

Combination Closed and Open Car of Pay-As-You-Enter Type for the Third Avenue Railroad Company, New York. Illustrated description of the design of new cars ordered. 3000 w. Elec Ry Jour—Jan. 23, 1909. No. 1898.

Pay-as-You-Enter Cars for the Third Avenue Railroad Company, New York.

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Illustrated description. 2000 w. Elec Ry Jour—Nov. 21, 1908. No. 367.

Steel Passenger Cars for the Hudson and Manhattan Railroad. Illustrated description of cars to be used in tunnels. 2000 w. Elec Ry Jour—Oct. 2, 1909. No. 8215.

New Cars of the Chicago Railways Company. Illustrated description of the new pay-as-you-enter cars. 2500 w. Elec Ry Jour—Nov. 7, 1908. No. 110.

Steel Cars for Chicago Railways Company. Illustrated detailed description of all-steel surface cars of the pay-as-you-enter type. 1500 w. Elec Ry Jour—Aug. 28, 1909. No. 7371.

Pay-Within Cars in Philadelphia. Gives an account of conditions to be met, and an illustrated description of the cars finally adopted and their operation. 5000 w. Elec Ry Jour—March 20, 1909. No. 3232.

Pay-Within Cars in Washington, D. C. Illustrates and describes the new cars being placed in service. 1500 w. Elec Ry Jour—Sept. 18, 1909. No. 7794.

A Novel Street-Railway Car. P. W. Price. Illustrated description of a prepayment type of car with center exit in use in Pittsburg. 600 w. Eng News—June 17, 1909. No. 5577.

New Steel Car of United Railways Company of St. Louis. Illustrated description of a steel passenger car of the pay-as-you-enter type. 1500 w. Elec Ry Jour—March 13, 1909. No. 3088.

The Barber Single-Truck Car Used on the Sunbury and Salingsgrove Electric Railway. Illustrated detailed description. 1500 w. Elec Ry Jour—Jan. 2, 1909. No. 1436.

The Life and Wear of Rolling-Stock. M. Stahl. A report dealing with answers to questions sent out in regard to improvements in axles, wheels and tires, with a study of new types of cars. Ills. 3000 w. Elect'n, Lond—Jan. 15, 1909. Serial. 1st part. No. 2072 A.

Suggested Improvements in the Construction of Our Electric Tramways. Gerald H. J. Hooghwinkel. Presents the advantages of the single-track, single-deck car urging its adoption in England. 1500 w. Tram & Ry Wld—Jan. 7, 1909. No. 2059 B.

New Cars for the Düsseldorf Tramways. Herr Stahl. Illustrated description of semi-convertible cars. 1900 w. Bul Int Ry Cong—Feb., 1909. No. 3279 G.

Double Motor Cars on the Blankenese-Ohlsdorf Railway (Automotrices couplées du Chemin de Fer électrique de Blanke-

Conductors

nese à Ohlsdorf par Hambourg). A. Le Vergnier. Illustrated description of a double car with two motors. Plate. 1500 w. Génie Civil—Nov. 7, 1908. No. 1119 D.

See also Single Phase, Track, and Trolley Lines, under STREET AND ELECTRIC RAILWAYS.

Car Testing.

An Autographic Recording Apparatus for Electric Railway Tests. Albert T. Childs. Illustrated description of an autographic testing apparatus which records in curves the continuous electrical performance of a car. 1800 w. Jour Worcester Poly Inst—Jan., 1909. No. 1840 C.

Car Ventilation.

Results of a Study of Car Ventilation in Chicago. Gives ventilation experiments made by J. F. Biehn and J. B. Gooken, with brief descriptions of systems tested and results. 3500 w. Elec Ry Jour—May 8, 1909. No. 4538.

Car Weights.

Car Weights as Affecting Operating Costs. Abstract of a paper by Milan V. Ayres, read at a meeting of Mass. St. Ry. Assn. 2200 w. Elec Ry Jour—June 19, 1909. No. 5593.

Car Weights as Affecting Operating Costs. M. V. Ayres. (Abstract.) Theoretical discussion, considering power consumption, car repairs, track repairs, etc. 4000 w. Elec Ry Jour—Oct. 7, 1909. No. 8455.

Car Wiring.

Fire Risks in Heavy Car Wiring and Control. Criticises prevailing methods and suggests the use of grooved slabs of asbestos slate, and placing the whole control apparatus in a fireproof compartment. 2000 w. Elect'n, Lond—April 9, 1909. No. 4025 A.

Communication.

The Installation and Protection of Telephones for Electric Railway Service. Frank F. Fowle. Illustrated detailed description, with information in regard to types, cost, etc. 4000 w. Elec Ry Jour—Dec. 5, 1908. No. 801.

Conductors.

Location of Conductors Other Than Third Rail. Report of the Committee on Standard Location for Conductors, Am. Ry. Assn. 800 w. R R Age Gaz—Nov. 27, 1908. No. 631.

Three-Wire System for Tramways. E. Goulding. Presents the advantages and economics of this system. Ills. 1500 w.

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Conduit System

Tram & Ry Wld—Jan. 7, 1909. No. 2058 B.

Conduit System.

Improvements in Conduit Railway Construction in London. Describes features of interest in the construction and management. 2500 w. Elec Ry Jour—July 3, 1909. No. 6099.

Controllers

Recent Developments in Railway Motor Control. Clarence Renshaw. (Abstract.) Considers improvements in unit switch control, and multiple unit operation with hand-operated controllers. Ills. 2000 w. Elec Ry Jour—Oct. 7, 1909. No. 8456.

Crossing Gates.

An Automatic Grade-Crossing Gate. J. B. van Brussel. Brief illustrated description of a crossing gate for electric railways, installed near Montreux, on Lake Geneva. 600 w. Eng News—May 20, 1909. No. 4782.

Cuba.

Electric Traction in Cuba. Brief illustrated description of the lines of the Havana Central R. R. Co. 1200 w. Tram & Ry Wld—April 1, 1909. No. 3985 B.

Current Clocks.

Results with Current Recording Clocks on the Grosse Berliner Strassenbahn. A report of improvement due to the installing of clocks in place of wattmeters. 1200 w. Elec Ry Jour—Sept. 11, 1909. No. 7676.

Current Economy.

Current Consumption. R. S. Pilcher. Read before Munic. Tram. Assn. Some suggestions for the systematic supervision of motor drivers that results in current saving. 2200 w. Elec Engr, Lond—Oct. 1, 1909. No. 8477 A.

Denver.

The Denver City Tramway System. Map, and illustrated detailed description of the system, its construction, power generation, equipment, operation, etc. With plates. 10800 w. Elec Ry Jour—Oct. 2, 1909. Souvenir Sec. No. 8216.

Direct Current.

Direct-Current, 1200-Volt, Railway Operation. Extracts from an article by G. H. Hill in *General Electric Review*, in which high potential methods as recently developed are discussed. Ills. 2400 w. Ry & Engng Rev. June 5, 1909. No. 5370.

Traction System Using Constant Direct Current. J. E. Dalemont. An account of

Electric Traction

a proposal by M. Potterat. 1800 w. Elec Wld—Oct. 14, 1909. No. 8554.

Electric Traction by Constant Intensity Continuous Current (Sur la Traction par le Courant continu à Intensité constante). J. Bourdel. An illustrated discussion of the system. 7800 w. Bul Soc Int des Elecns—April, 1909. No. 4817 F.

Electric Traction by Constant Intensity Continuous Current (Sur la Traction par Courant continu à Intensité constante). Discussion on M. Bourdel's paper on this subject. 2500 w. Bul. Soc Int des Elecns—May, 1909. No. 5720 F.

Electric Traction by Constant-Intensity Continuous Current (Discussion de la Communication de M. J. Bourdel). M. Bourdel's reply to discussion. 5300 w. Bul Soc Int d Elecns—June, 1909. No. 6506 F.

See also Voltage, under STREET AND ELECTRIC RAILWAYS.

Dispatching.

See Signalling, under STREET AND ELECTRIC RAILWAYS.

Economics.

Action Necessary to Assure a Reasonable Return on the Investment. Charles V. Weston. Discusses the present situation, reviewing the development of transportation in city streets and related matters. 4500 w. Elec Ry Jour—Dec. 26, 1908. Serial. 1st part. No. 1252.

Electric Traction.

Early Experiments in Electric Traction. W. W. Lackie. Presented to the Glasgow Sec. of the Inst. of Elec. Engrs. Information regarding Robert Davidson's experiments in 1837. Ills. 2000 w. Elec Engr, Lond—Feb. 19, 1909. No. 2876 A.

Rapid Transit in the Future. Trans. from *Reclams Universum*. Illustrated description of August Scherl's plan. 800 w. Sci Am Sup—Aug. 7, 1909. No. 6962.

A Criticism of August Scherl's Traction System (Kritische Betrachtungen zu einem neuen Schnellbahnsystem von August Scherl). Herr Biedermann. An examination of Scherl's proposed high-speed mono-rail system. Ills. Serial. 1st part. 2200 w. Deutsche Bau—Aug. 14, 1909. No. 7969 B.

The Development of Rapid Transit in Cities (Die Entwicklung der Stadtschnellbahnen). F. Musil. Refers particularly to conditions in Berlin and Vienna. Ills. Serial. 1st part. 2200 w. Zeitschr d Oest Ing u Arch Ver—Aug. 6, 1909. No. 7984 D.

STREET AND ELECTRIC RAILWAYS

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Rapid Transit in Cities (Stadt-Schnellbahnen). G. Brecht. Discusses the larger factors entering into the solution of traffic problems, capacity, speed, etc. Ills. Serial. 1st part. 5000 w. Glasers Ann—Sept. 15, 1909. No. 8682 D.

Power Requirements of a Street Railway (Bestimmung des Kraftbedarfs für Strassenbahnen). Fritz Block. Mathematical explanation of the method of calculation. Ills. Serial. 1st Part. 1500 w. Elektrotech Rundschau—Jan. 2, 1909. No. 2824 D.

Calculations for Traction Projects (Les Méthodes de Calcul des Projets de Traction). M. Parodi. Describes the author's methods of solving motor and train-movement problems. Ills. 10800 w. Bul Soc Ind d'Elecns—March, 1909. No. 4209 F.

On Certain Features of the Traction Problem (Sur certaines Conditions du Problème de la Traction). J. de Traz. A discussion of the power-requirements problem. Ills. 6700 w. Bul Soc Int des Elecns—May, 1909. No. 5719 F.

Electric Traction on Railways (La Traction électrique sur les Chemins de Fer). H. Marchand. Makes a general comparison between steam and electricity, in this number. Ills. Serial, 1st part. 14000 w. Soc Belge d'Elecns—June, 1909. No. 6501 E.

England.

English Electric Railways. Outlines what has been accomplished in England up to the present time. 2500 w. R R Age Gaz—July 9, 1909. No. 6237.

Fish Plates.

An Electro-Mechanical Fish Plate (Une Eclisse électro-mécanique). E. Sauvage. Describes an invention so-called because it may be used on electric railways without any further bond. Ills. 4000 w. Bul Soc d'Encour—May, 1909. No. 6523 G.

France.

Electric Traction on the Fayet-Chamionix Line and Its Extension to the Swiss Frontier (La Traction électrique sur la Ligne du Fayet à Chamonix et à la Frontière Suisse). M. Auvert. Illustrated description of the power plants, stock, etc., of this direct-current road in France. Plates. 5000 w. Rev Gen d Chemins de Fer—Nov., 1908. No. 1112 G.

Freight Traffic.

Freight Service of the Toledo & Western Railroad. An illustrated account of a prosperous undertaking following closely

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the steam railroad methods. 1200 w. Elec Ry Jour—Sept. 18, 1909. No. 7792.

Express and Freight Traffic on Interurban Lines. S. L. Vaughan. Discusses tariffs and classifications, solicitation, errors, shorts, bad orders, claims, revenue and accounting. 3500 w. Elec Ry Jour—Oct. 7, 1909. No. 8453.

Great Northern.

Electric Power Equipment for the Cascade Tunnel, Great Northern Ry. Extracts from article by A. H. Halloran, with illustrations and particulars of the three-phase installation. 1800 w. Ry & Engng Rev—Sept. 18, 1909. No. 7839.

Hamburg.

The Blankenese-Ohlsdorf City and Suburban Railway (Die Stadt- und Vorortbahn Blankenese-Ohlsdorf). H. v. Glinski. A detailed description of this railway at Hamburg-Altona. Ills. Serial. 1st part. 2700 w. Zeitschr d Ver Deutscher Ing—Oct. 3, 1908. No. 597 D.

Havana.

The Havana Central Railroad. Reginald Gorham. Brief illustrated description of an up-to-date long-distance electric railway. 700 w. Elec Wld—April 15, 1909. No. 3942.

Interurban.

Interurban Railway Developments in the United States. George Ethelbert Walsh. A discussion of the competition between steam and electric railways. 3500 w. Cassier's Mag—Feb., 1909. No. 3237 B.

Development of Traffic on Interurban Lines. Abstract of a paper by C. M. Cheney before Iowa Street and Interurban Ry. Assn., which discusses methods of building up business in the Middle West. 2500 w. Ry & Engng Rev—June 5, 1909. No. 5372.

The Beebe Syndicate Interurban System in Central New York—Construction Features. Map and illustrated description of an extensive electric interurban railway system being developed to connect Syracuse, Rochester, Auburn, Oswego, and other points in Central New York. 2000 w. Elec Ry Jour—Sept. 25, 1909. No. 8036.

The Beebe Syndicate Interurban System in Central New York—Power Supply Equipment and Traffic Features. Illustrated description of the power supply and distribution scheme, rolling stock, etc. 2000 w. Elec Ry Jour—Oct. 16, 1909. No. 8717.

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Interurban

Waterbury Extensions of the Connecticut Company. Illustrates and describes recent extensions to North Woodbury and to Thomaston, Conn. 1500 w. Elec Ry Jour—July 31, 1909. No. 6775.

New Interurban Railways in the Central States. Map and general information. 2000 w. Elec Ry Jour—Jan. 2, 1909. No. 1435.

Electric Railways in the Ohio Valley Between Steubenville, Ohio, and Vanport, Pennsylvania. George B. Francis. Illustrated description of a high-grade interurban road. 5500 w. Pro Am Soc of Civ Engrs—Nov., 1908. No. 648 E.

Pittsburg, Harmony, Butler & New Castle 1200-Volt D. C. Railway. John R. Hewett. Illustrated detailed description of the electrification scheme. 2200 w. Elec Ry Jour—Jan. 16, 1909. No. 1754.

Extensions of the Joliet & Southern Traction Company. An illustrated account of new construction and other improvements. 3000 w. Elec Ry Jour—March 6, 1909. No. 2959.

Maintenance and Improvements on the Illinois Traction System. Treats of maintenance, methods, organization, traffic, and extension of lines. Ills. 5400 w. Elec Ry Jour—April 17, 1909. No. 3967.

New Interurban Line of the Joplin & Pittsburg Railway Company. Illustrated description of a well-built line in Kansas and Missouri. 3000 w. Elec Ry Jour—March 13, 1909. No. 3087.

The Denver and Interurban 11000-Volt Railroad. Illustrated description of the electrified division of the C. & S. Ry. between Denver & Boulder, Colo., operated by 11000-volt alternating-current. 2500 w. Elec Ry Jour—Oct. 2, 1909. Souvenir Sec. No. 8217.

The Oregon Electric Railway System. Illustrated detailed description of the portion of the line in operation, connecting Portland, Salem, Hillsboro and Forest Grove. 2500 w. Elec Ry Jour—March 20, 1909. No. 3231.

Traffic Features of the Los Angeles & Redondo Railway. Illustrates and describes features of passenger and freight traffic. 1200 w. Elec Ry Jour—Sept. 11, 1909. No. 7675.

The Brantford and Hamilton Electric Railway. Illustrated description of a line in Ontario eventually to form part of a system joining Toronto and Detroit. 2000 w. Elec Ry Jour—Jan. 2, 1909. No. 1434.

The British Columbia Electric Railway. Describes the service, operation, power generation, substations, etc. 2500 w. Elec

Locomotives

Ry Jour—Oct. 2, 1909. Souvenir Sec. No. 8220.

See also Central Stations, under ELECTRICAL ENGINEERING, GENERATING STATIONS.

Japan.

Municipal Electric Road of Osaka. Yoshio Katagiri. Brief illustrated description of the only municipally-owned street railway in Japan. 400 w. Munic Jour & Engr—Feb. 3, 1909. No. 2236.

Locomotives.

Experimental Electric Locomotive. Illustrated description of a design for the purpose of trying a scheme of transmitting power to the drive wheels through side rods; also editorial. 2200 w. Ry & Engng Rev—May 15, 1909. No. 4740.

A New Side-Rod Electric Locomotive. Illustrated description of a novel type recently built and tested. 1500 w. Elec Ry Jour—May 8, 1909. No. 4537.

Electric Locomotives for the Great Northern. Illustrates and describes the mechanical construction which is a distinct departure from previous practice. 600 w. R R Age Gaz—Jan. 15, 1909. No. 1793.

Electric Locomotives for the G. N. Illustrated description of recently completed electric locomotives for operating trains through the Cascade tunnel. 900 w. Ry & Loc Engng—March, 1909. No. 2938 C.

New York Central Electric Locomotives. Illustrated description of changes made in the original design which greatly increase the efficiency. 2500 w. R R Age Gaz—June 25, 1909. No. 5888.

Alternating Current Voltage Control. William B. Kouwenhoven. Describes the alternating current system of control in use on the New Haven electric locomotives. 2000 w. Ry & Loc Engng—Sept., 1909. No. 7579 C.

Geared Freight Locomotive for the New York, New Haven & Hartford Railroad. Illustrated description. 1500 w. Elec Ry Jour—Sept. 25, 1909. No. 8037.

Change in Wheel Arrangement of New Haven Electric Locomotives. Drawing and brief description. 300 w. R R Age Gaz—Dec. 4, 1908. No. 804.

Detroit River Tunnel Locomotives. Illustrates and describes locomotives to be operated by direct current for hauling both freight and passenger trains. 2200 w. R R Age Gaz—Aug. 20, 1909. No. 7169.

Electric Locomotive for the Detroit River Tunnel. Illustrated detailed description. 2000 w. Eng News—June 24, 1909. No. 5869.

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Articulated Electric Locomotive for the Detroit River Tunnel. Illustration and description of this powerful machine for hauling both passenger and freight trains through the tunnel. 2200 w. *Am Engr & R R Jour*—Sept., 1909. No. 7577 C.

New Locomotives of the Chicago City Railway. Illustrated description of 40-ton electric locomotives for switching purposes. 1000 w. *Elec Ry Jour*—Nov. 21, 1908. No. 366.

Four-Speed Three-Phase Locomotive for the Simplon Tunnel. Plate and illustrated description of electric locomotives recently completed for this service. 3000 w. *Engng*—Oct. 1, 1909. Serial. 1st part. No. 8491 A.

The F 4/4 Electric Locomotives on the Simplon Railway (Die elektrischen F 4/4-Lokomotiven am Simplon). E. Thomann and K. Schnetzler. Illustrated detailed description. Serial. 1st part. 4400 w. *Zeitschr d Ver Deutscher Ing*—April 17, 1909. No. 5074 D.

New Electric Locomotives for the Simplon Tunnel (Les Nouvelles Locomotives électriques du Tunnel du Simplon). Illustrated description. Plate. 3000 w. *Génie Civil*—July 10, 1909. No. 7229 D.

Four-Speed, Three-Phase, Brown-Boveri Locomotives (Locomotives Triphasées à quatre Vitesses, Système Brown-Boveri). M. Henry. Illustrated description. 2000 w. *L'Elec*—Sept. 11, 1909. No. 8619 D.

The New Three-Phase Ganz Locomotives of the Valtellina Railway. H. Marchand-Thiriar. Illustrated detailed description. 2800 w. *Bul Int Ry Cong*—Feb., 1909. No. 3277 G.

The Construction of Alternating-Current Locomotives (Neuere Bauarten von Wechselstrom-Lokomotiven). G. Brecht. Discusses a number of recent designs. Ills. 2300 w. *Zeitschr d Ver Deutscher Ing*—June 19, 1909. No. 6729 D.

The Driving of Electric Trunk-Line Locomotives (Beitrag zur Frage des Antriebes elektrischer Vollbahnlokomotiven). Herr Heyden. Discusses the various systems of power transmission from motor to axle. Ills. 2800 w. *Elek Kraft u Bahnen*—June 4, 1909. No. 6711 D.

New Electric Freight Locomotives of the Italian State Railways (Neue elektrische Güterzuglokomotive der Italienischen Staatsbahnen). K. von Kando. Illustrated detailed description. Serial. 1st part. 5500 w. *Zeitschr d Ver Deutscher Ing*—Aug. 7, 1909. No. 7997 D.

See also Simplon, under STREET AND ELECTRIC RAILWAYS.

Mexico City

London.

Putney to Hammersmith Tramway. Illustrated description of the first trolley line over a London bridge. 2500 w. *Tram & Ry Wld*—Feb. 4, 1909. No. 2531 B.

The Electrical System of the London County Council Tramways. John Hill Rider. Describes the development of the undertaking and the equipment of the Greenwich generating station. Gives cost details. Ills. 13500 w. *Inst of Elec Engrs*—April 1, 1909. No. 3775 N.

The Electrical System of the L. C. C. Tramways. Abstract of J. H. Rider's paper before the Inst. of Elec. Engrs. Illustrated description of the electric power supply. 3500 w. *Elec Rev, Lond*—April 30, 1909. Serial. 1st part. No. 4601 A.

The Tramways of the County of London. Map, and illustrated detailed description of their organization, working, construction, equipment, rolling stock, etc. 7000 w. *Tram & Ry Wld*—Sept. 2, 1909. No. 7765 B.

Los Angeles.

Electric Railways at Los Angeles. Map and description of the transportation features. Plates. 3500 w. *Elec Ry Jour*—Oct. 2, 1909. Souvenir Sec. No. 8224.

Management.

The Development of a Small Road. An illustrated account of the system at Sheboygan, Wis. 3500 w. *Elec Ry Jour*—Feb. 13, 1909. No. 2444.

Street Railways vs. People. Samuel H. Barker. From an address before Wharton Sch. of Fin. & Com., Univ. of Penn. Discusses street railway capitalization and management in large cities, cost of service, etc. 4000 w. *Eng News*—Feb. 25, 1909. No. 2756.

Massachusetts.

Financial Condition of Massachusetts Street Railways. James L. Richards. Abstract of an address before the Mass. St. Ry. Assn. 5000 w. *Elec Ry Jour*—Dec. 19, 1908. No. 1045.

Mexico City.

Conditions of Electric Railway Operation in Mexico City. An illustrated article describing the character of the population and features of the tramway system. 3500 w. *Elec Ry Jour*—May 1, 1909. No. 4371.

Construction and Operating Features of the Mexico City Tramways. Describes construction, power plant, equipment and operation. Ills. Also editorial. 7000 w. *Elec Ry Jour*—June 5, 1909. No. 5249.

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Motors

Motors.

See Railway Motors, under ELECTRICAL ENGINEERING, DYNAMOS AND MOTORS.

Motor Suspension.

Motor Suspension on Electric Cars (Die günstigste Motoraufhängung bei elektrischen Fahrzeugen). G. Brecht. A discussion of the factors influencing the location of the motor. Ills. 2500 w. Elek Kraft u Bahnen—April 3, 1909. No. 5061 D.

Operation.

Operating Features of the Sea View Railroad Company. Illustrates and describes a single-track line on the western shores of Narragansett Bay. 2500 w. Elec Ry Jour—Oct. 9, 1909. No. 8513.

Pará.

The Pará Tramway and Lighting System. An illustrated description of the complete reconstruction of the tramway system, and the installation of electric lighting. 2500 w. Elec Ry Jour—March 6, 1909. No. 2960.

The Tramways of Pará. An illustrated account of the reconstruction and electrification of the tramways. 3300 w. Tram & Ry Wld—March 4, 1909. No. 3228 B.

Paris.

The Metropolitan of Paris (Le Chemin de Fer Métropolitain de Paris). R. Godfernaux. A review of recent developments. Ills. 14000 w. Rev Gen d Chemins de Fer—April, 1909. No. 4823 G.

Portland, Ore.

Operating Features of the Portland Railway, Light & Power Company. An illustrated article explaining shop records and methods, freight and passenger service, power improvements, etc. 6000 w. Elec Ry Jour—Oct. 2, 1909. Souvenir Sec. No. 8222.

Power Losses.

Economy in Current Consumption. C. J. Spencer. Discusses the sources of loss and the remedies on tramways. 2500 w. Tram & Ry Wld—Nov. 5, 1908. No. 432 A.

Power Stations.

See Central Stations, and Hydro-electric, under ELECTRICAL ENGINEERING, GENERATING STATIONS.

Power Transmission.

See Electrification, under RAILWAY ENGINEERING, MOTIVE POWER AND EQUIPMENT.

Rails

Rack Railways.

A New Mountain Railway in Tyrol. Brief illustrated description of the Rittner line, a portion of which is a rack on the Strub system. 1800 w. Elec Engng—Dec. 10, 1908. No. 1205 A.

The Montreux-Glion Rack Railway (Die elektrische Zahnradbahn Montreux-Glion). R. Zehnder-Spoerry. Illustrated description of the line, rolling stock, etc. Serial, 1st part. 3000 w. Schweiz Bau—July 10, 1909. No. 7282 B.

The Chamonix-Montenvers Rack Railway (Le Chemin de Fer à Crémallère de Chamonix au Montenvers). Gustave Chapuis. Illustrated description. Serial. 1st part. 2000 w. Bul Tech d l Suisse Romande—Sept. 10, 1909. No. 8622 D.

See also Switzerland, under STREET AND ELECTRIC RAILWAYS.

Rail Bonding.

Autogenous Rail Welding (Autogene Schienenschweissung). Theo. Kautny. Describes and compares with regard to efficiency the mechanical, thermit, and blowpipe methods. Ills. 3000 w. Mit d Ver f d Förd Lokal u Strassenbahnwesens—March, 1909. No. 4248 F.

Railroad Crossings.

See Crossings, under RAILWAY ENGINEERING, PERMANENT WAY AND BUILDINGS.

Railless.

General Urban and Interurban Transportation and Railless Electric Traction. F. Douglas Fox. Read at Dublin meeting of the British Assn. Aims to show in detail the comparative economics of the tramway and the mechanical omnibus. 4200 w. Engr, Lond—Nov. 20, 1908. No. 746 A.

Railless Traction Systems. An illustrated report by a Leeds committee of investigation, especially considering the Mercedes-Stoll, and the Filovia systems. 2200 w. Tram & Ry Wld—July 8, 1909. No. 6607 B.

Railless Electric Traction. Illustrated description of the railless trolley system at London. 2500 w. Tram & Ry Wld—Oct. 7, 1909. No. 8871 B.

Electric Trolley Automobiles (Elektrische Oberleitungs-Automobillinien). Ludwig Stoll. Illustrates and describes several European railless electric-traction systems. 4000 w. Mit d Ver f d Förd Lokal u Strassenbahnwesens—March, 1909. No. 4247 F.

Rails.

T-Rail in Paved Streets. R. A. Dyer, Jr. Read before the St. Ry. Assn. of the State

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Rails

of N. Y. Information concerning their use, construction and service. 1200 w. Elec Ry Jour—Nov. 14, 1908. No. 237.

Rail Grooves and Track Gage for Curved Tracks. C. W. L. Filkins. Discusses the determination of the minimum groove, and the rail gage-line. Diagrams. 3000 w. Elec Ry Jour—Oct. 6, 1909. No. 8452.

The Origin and Development of Grooved Rails (Die Rillenschiene, ihre Entstehung und Entwicklung). Philipp Fischer. A historical review, illustrating many profiles. Serial. 1st part. 2000 w. Stahl u Eisen—Aug. 11, 1909. No. 7951 D.

Rawtenstall.

Rawtenstall Corporation Tramways. Illustrated description of English tramways recently opened. Map. 3000 w. Tram & Ry Wld—May 6, 1909. No. 4954 B.

Records.

Record System of the Third Avenue Railroad Company, New York. Explains system and gives forms that have proved valuable in recording the performance of equipments in detail. 900 w. Elec Ry Jour—March 27, 1909. No. 3509.

A System of Record Keeping as Applied to Electric Railway and Tramway Equipment. R. J. M. Holmes. Outlines a card filing system of record keeping. 1000 w. Elec Rev, Lond—Jan. 15, 1909. No. 2063 A.

See also Record Systems, under CIVIL ENGINEERING, CONSTRUCTION.

Record Systems.

See Filing Systems, under INDUSTRIAL ECONOMY.

Rio de Janeiro.

The Transmission and Distribution Systems of the Rio de Janeiro Tramway. Light and Power Company. L. L. Perry. Editorial. Illustrates and describes a 51-mile transmission system, receiving three-phase, 50-cycle current at 88000 volts. 2000 w. Elec Wld—Aug. 12, 1909. No. 7011.

Salt Lake City.

Rehabilitation of the Utah Light & Railway Property. Illustrated description of the reconstruction of a line having 100 miles of track, practically all within Salt Lake City, Utah. 3000 w. Elec Ry Jour—Oct. 2, 1909. Souvenir Sec. No. 8218.

Sanding Gears.

See Brakes, under STREET AND ELECTRIC RAILWAYS.

San Francisco.

Electric Railways of San Francisco and Its Environs. Illustrates and describes

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features of San Francisco and Oakland railways, their operation and equipment. 9000 w. Elec Ry Jour—Oct. 2, 1909. Souvenir Sec. No. 8223.

Seattle.

Railways of the Puget Sound District. Map and illustrated description of the electric railways of Seattle, which are of special interest because of the natural features and great increase in population. 7000 w. Elec Ry Jour—Oct. 2, 1909. Souvenir Sec. No. 8221.

Shops.

The Reconstructed Car House and Shops of the Third Avenue Railroad Company. Illustrated description of features of the recently completed reconstruction at the 66th Street shops. 3500 w. Elec Ry Jour—April 3, 1909. No. 3664.

Shops and Equipment Maintenance of the Illinois Traction System. Illustrates and describes the new shops at Decatur, and outlines the standardization work. 2500 w. Elec Ry Jour—April 3, 1909. No. 3669.

The Central Repair Depot of the London County Council Tramways. W. E. Ireland. Illustrated description of the buildings and equipment. Read before the Munic. Tram. Assn. 6500 w. Tram & Ry Wld—Oct. 7, 1909. No. 8872 B.

Central Repair Depot, L. C. C. Tramways. W. E. Ireland. Abstract of a paper read before the Munic. Tram. Assn., London. Describes the shops and equipment. Ills. 3000 w. Elec Engr, Lond—Sept. 24, 1909. No. 8338 A.

Signalling.

Automatic Electric Railway Signals. William K. Waldron. Explains the principles involved, and gives illustrated description of the "Solenoid" type, operated on third-rail, direct-current track circuits. 1500 w. Elec Wld—Feb. 11, 1909. No. 2391.

Automatic Signals for Direct and Alternating Current Railroads. W. B. Kouwenhoven. Explains the single-rail and double-rail systems. 2000 w. Ry & Loc Engrg—Aug., 1909. No. 6872 C.

Double-Service Electric Railway Signals. W. K. Waldron. An explanation in detail of their installation. 1500 w. Elec Wld—Aug. 19, 1909. No. 7174.

Signaling of the Brooklyn Bridge and Its Manhattan and Brooklyn Terminals. Illustrated detailed description of the special system of automatic signaling installed. 2200 w. Sig Engr—April, 1909. No. 3998.

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Signalling

Street Railway Interlocking at Washington. Illustrated description of system installed. 800 w. *R R Age Gaz*—April 2, 1909. No. 3737.

Electric Interlocking and Signaling System for the Street Railways at the Union Station Plaza, Washington, D. C. Illustrated detailed description of the scheme. 3000 w. *Eng News*—April 15, 1909. No. 3980.

Cab Signals and Cab Telephones on the Toronto and York Radial Railway. Illustrated description of the signalling apparatus installed on an electric line running from Toronto to Port Credit. 1200 w. *R R Age Gaz*—Aug. 6, 1909. No. 6925.

The Signal and Dispatching System on the Mimico Division of the Toronto & York Radial Railway. Illustrated description. 1200 w. *Elec Ry Jour*—June 12, 1909. No. 5357.

Recent Traction Safety Devices (Neuere Zugsicherungen). L. Kohlfürst. Describes various signal systems. Ills. Serial. 1st part. 4000 w. *Elek Kraft u Bahnen*—Aug. 14, 1909. No. 7990 D.

Simplon.

New Features of the Simplon Line. C. L. Durand. Describes new points relating to the tunnel section and the new Brown-Boveri electric locomotives used. Ills. 3000 w. *Elec Rev, N Y*—Feb. 20, 1909. No. 2554.

The Operation of the Simplon Tunnel Railway. Illustrated description of the old and new locomotives and the power supply. 1400 w. *Eng News*—July 29, 1909. No. 6767.

Single-Phase.

Constants of Single-Phase Railway Circuits. A. W. Copley. Report of tests giving data of interest. 2500 w. *Elec Jour*—Nov., 1908. No. 208.

Some Notes on the Single-Phase Railway System. Clarence Renshaw. Considers the equipment and operation of single-phase installations. Ills. 6000 w. *Elec Jour*—Dec., 1908. No. 976.

The Chicago, Lake Shore & South Bend Railway. Illustrated detailed description of an important single-phase installation extending from South Bend, Ind., to Pullman, Ill. 4000 w. *Elec Ry Jour*—April 10, 1909. No. 3823.

Conversion of New Canaan Branch from 500-Volt D. C. to 11,000-Volt A. C. Operation. Brief illustrated description of the line and rolling stock on the branch from Stamford to New Canaan, Conn. 800 w. *Elec Ry Jour*—May 15, 1909. No. 4650.

Spokane

Electric Traction by Simple Alternating Current in Europe. H. Merchand-Thiriar. Gives a description of the Locarno-Pontebrolla-Bignasco line on the monophasic system. Ills. 2400 w. *Bul Int Ry Cong*—Jan, 1909. No. 2434 G.

Electric Traction by Simple Alternating Current on European Railways. H. Marchand-Thiriar. Particulars in regard to the Seebach-Wettingen line. 3500 w. *Bul Int Ry Cong*—March, 1909. No. 3957 G.

The Electrification on the London, Brighton, and South Coast Railway. Editorial discussion of this overhead single-phase system. 2500 w. *Engng*—Feb. 5, 1909. No. 2488 A.

Single-Phase Electric Traction on the Swedish State Railways. Abstract of a report prepared by R. Dahlander, dealing with the power house, line and locomotive equipment, etc. 3300 w. *Elect'n, Lond*—March 5, 1909. No. 3151 A.

Recent Improvements on the Hamburg-Blankenese-Ohlendorf High Tension Single-Phase Railway. Illustrates and describes the mechanical features of the new cars and their operation. 2000 w. *Elec Ry Jour*—Oct. 23, 1909. No. 8718.

The Rotterdam - Haag - Scheveningen Railway. Illustrated detailed description of a 10000-volt, single-phase line in Holland, its construction, equipment and service. 3000 w. *Elec Ry Jour*—Oct. 2, 1909. No. 8214.

Single-Phase Extensions of the Lyons (France) City Lines. Illustrates and describes the line construction and rolling stock of two 6000-volt single-phase catenary lines. 1000 w. *Elec Ry Jour*—Sept. 4, 1909. No. 7545.

The Application of Single-Phase Current to the Borinage Railway (Application du Courant monophasé au Chemin de Fer vicinal du Borinage). P. Rodigas. Illustrated description of the lines, equipment, etc. *Soc Belge d'Elecons*—April, 1909. No. 4815 E.

See also *Railway Motors*, under **ELECTRICAL ENGINEERING, DYNAMOS AND MOTORS**.

Speed Recorders.

A Calibrated Speed Recorder. A. B. Stitzer. Illustrates and describes a speed recorder adapted for electric traction work, making a record that can be read without a correcting factor. 1500 w. *Pro Engrs' Club of Phila*—Jan., 1909. No. 6358 D.

Spokane.

Electric Railways in and About Spokane. Illustrated descriptions of the track

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St. Clair Tunnel

construction, power stations, rolling stock, shops, etc. Maps. 3000 w. Elec Ry Jour—Oct. 2, 1909. Souvenir Sec. No. 8219.

St. Clair Tunnel.

Electrification of the St. Clair Tunnel. Illustrated detailed description of the tunnel, equipment, etc. 6000 w. Elec Ry Jour—Nov. 14, 1908. No. 235.

Stray Currents.

Electric Traction Vagabond Currents. J. G. Cunliffe and R. G. Cunliffe. Read before the Manchester Sec. of the Inst. of Elec. Engrs. An investigation of the principal vagabond current phenomena. 2200 w. Elec Engr, Lond—March 12, 1909. Serial. 1st part. No. 3403 A.

Leakage Currents. A discussion of their causes and effects. 1200 w. Elec Rev, Lond—Aug. 13, 1909. No. 7310 A.

Substations.

See same title, under ELECTRICAL ENGINEERING, TRANSMISSION.

Subways.

The New York Rapid Transit Subway. William Barclay Parsons. Illustrated detailed description of the design, construction, conditions, etc. Discussion. 5000 w. Inst of Civ Engrs—No. 3739. No. 2795 N.

Arnold Report on New York Subway Traffic. The sixth report by Bion J. Arnold, dated Dec. 31, 1908. 4000 w. Elec Ry Jour—Jan. 30, 1909. No. 2133.

The Return on the Investment in the New York Subways. Abstract of the seventh report giving an analysis of earnings and expenses. 3500 w. Elec Ry Jour—Feb. 27, 1909. No. 2779.

The Bowling Green Improvement of the New York Rapid Transit Railroad. Illustrates and describes changes between Bowling Green station and South Ferry, made necessary by the maximum Brooklyn traffic. 3000 w. Eng Rec—March 13, 1909. No. 3106.

Progress on the Bridge Loop Subway Illustrates and describes work on the loop which will connect Brooklyn Bridge terminal with the Manhattan and Williamsburg bridge terminals. 3500 w. Eng Rec—March 27, 1909. No. 3537.

Progress on the Subway Bridge Loop, New York. Illustrates and describes recent work on this loop which will connect the Brooklyn and Williamsburg bridges in Manhattan. 2500 w. Eng Rec—June 26, 1909. No. 6001.

The New Tunnel System Under the Hudson River. Plan and brief description

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of this tunnel system, nearing completion. 1600 w. Eng Rec—July 24, 1909. No. 6651.

Opening of the Terminal Station of the Hudson and Manhattan Railroad. Illustrates and describes details of stations, track construction and service. 5000 w. Elec Ry Jour—July 17, 1909. No. 6367.

The Hudson and Manhattan Tunnel System. J. Vipond Davies. A detailed review of the history of the tunnel projects, the organization and work plants are given in the present number. 5000 w. R R Age Gaz—Sept. 17, 1909. Serial. 1st part. No. 7799.

Washington Street Subway. Brief illustrated description of the new tunnel built by the Boston Transit Commission. 2000 w. Elec Ry Jour—Nov. 28, 1908. No. 498.

Washington Street Tunnel, Boston. John S. Hodgson. Illustrated description of this recently opened tunnel for the Boston Rapid Transit System. 3000 w. R R Age Gaz—Nov. 27, 1908. No. 629.

Engineering Features of the Washington Street Tunnel. Illustrated description of this Boston tunnel and its relation to the rapid transit facilities. 3500 w. Engng—Jan. 15, 1909. No. 2074 A.

Electrical Equipment of the Washington Street Subway, Boston. Illustrated description of the arrangements for the supply of power and lighting. 3000 w. Elec Ry Jour—May 22, 1909. No. 4795.

The Report on a Proposed Subway System for Street Cars and Elevated Railway Trains in Chicago. Map and explanation of the proposed subways and the system of construction, with brief reference to earlier projects. Also editorial. 5000 w. Eng News—June 3, 1909. No. 5218.

A Supplementary Report on the Proposed Subway System for Street Cars and Elevated Railway Trains in Chicago. Also editorial note. 2500 w. Eng News—Aug. 19 1909. No. 7142.

Accounts of the London Tube Railways. A detailed analysis for the year ending June 30, 1908. 2500 w. Elect'n, Lond—Dec. 11, 1908. No. 1209 A.

The Metropolitan District and Allied Tube Railways. Illustrated account of the methods and working of the Metropolitan District Railway and three underground electric lines in London. 6000 w. Tram & Ry Wld—Aug. 5, 1909. No. 7131 B.

Underground Railway Construction in Paris. A. J. Thompson. Illustrates and describes the recent construction, including difficult tunneling in city streets, reinforced-concrete work, etc. 2000 w. Cassier's Mag—March, 1909. No. 2921 B.

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A Project for Underground Electric Railways in Vienna (Projekt, betreffend elektrische Untergrundbahnen durch die Innere Stadt Wien). Karl Hochenegg. A brief outline of the proposed lines. Ills. Serial, 1st part. 2000 w. Zeitschr d Oest Ing u Arch Ver—June 25, 1909. No. 6597 D.

Project for a Subway in Vienna (Projekt, betr. elektrische Untergrundbahnen durch die Innere Stadt Wien). Karl Hochenegg. Brief review of the project. Ills. Serial, 1st part. 1500 w. Elek Kraft u Bahnen—Sept. 4, 1909. No. 8904 D.

Extensive Engineering Undertaking. Information from the report of the Royal Commission appointed by the Government of New South Wales to suggest the best practical method of establishing direct communication between the northern and southern sides of Sydney Harbor. Recommends an electric tube railway. Map. 2500 w. Aust Min Stand—April 7, 1909. No. 4619 B.

See also Caissons, and Reinforced Concrete, under CIVIL ENGINEERING, CONSTRUCTION.

Subway Signalling.

Time Speed Control Signals. George S. Hodgins. Describes the plan for governing approach trains to the 96th st. station of the N. Y. subway, which is a combination of the automatic stop and the time-lock principle. Ills. 3000 w. Ry & Loc Engng—Aug., 1909. No. 6869 C.

The Signals in the New Tunnels of the Hudson & Manhattan. J. Leisenring. Illustrated detailed description of the automatic block signal system installed. 2200 w. R R Age Gaz—Oct. 8, 1909. Serial, 1st part. No. 8450.

Subway Stations.

The Stations of the Washington St. Tunnel, Boston, Mass. Laurence B. Manley. An illustrated description of the tunnel stations and their appurtenances. 4500 w. Eng News—Oct. 7, 1909. No. 8402.

Surface Contact.

The "G. B." System from a Tramway Manager's Point of View. Stanley Clegg. Read before the Inst of Elec. Engrs. Describes the system as installed at Lincoln, giving the writer's experience of it under working conditions. 7500 w. Elec Engr, Lond—Jan. 15, 1909. No. 2061 B.

The "G. B." Tramway System and Its Results in Lincoln. S. Clegg. Read before the Incor. Assn. of Munic. & Co. Engrs. An account of the working of this surface-contact system. Also discussion. 5500 w. Surveyor—Oct. 1, 1909. No. 8474 A.

Switzerland

The Suchostawer Stud System. Illustrated description of a surface contact system for electric traction where a skate suspended from the motor comes in contact with a series of studs. 1500 w. Engng—May 28, 1909. No. 5263 A.

Switzerland.

The Loetschberg Tunnel Electric Railroad. C. L. Durand. Illustrated description of the Bernese Oberland line in Switzerland, and its passage through this important tunnel. 2000 w. Elec Rev, N Y—March 6, 1909. No. 3007.

The Montreux-Bernese Oberland Electric Railroad. B. F. Hirschauer. Illustrated description of a new line through a picturesque mountain region in Switzerland. 2500 w. Elec Rev, N Y—Feb. 6, 1909. No. 2321.

The Railway of the Bernese Alps (Visite aux Travaux du Chemin de Fer des Alpes Bernoises). A. Maury. Report of a visit by a committee of the Soc. Ing. Civ. de France. Brief description of the line and of the Loetschberg tunnel. 10000 w. Mem Soc Ing Civ de France—Oct., 1908. No. 1307 G.

The Martigny-Châtélard Electric Railway (Elektrisch betriebene Bahn Martigny-Châtélard). S. Herzog. Illustrated detailed description of this mountain line which includes stretches on both the adhesion and rack systems. Serial, 1st part. 1000 w. Elektrotech Rundschau—Dec. 5, 1908. No. 1993 D.

The Monthey-Champéry Railway (Die Monthey-Champéry-Bahn). Illustrated description of a line in Switzerland having stretches on the combined rack and adhesion system. Serial, 1st part. 2000 w. Schweiz Bau—Jan. 2, 1909. No. 2689 B.

The Bellinzona-Mesocco Railway (Die elektrische Bahn Bellinzona-Mesocco). J. G. Boesch. Illustrated detailed description. Serial, 1st part. 1500 w. Elek Kraft u Bahnen—Jan. 4, 1909. No. 2824 D.

The Chamonix Martigny Electric Railway. C. Van Langendonck. Illustrated description of a narrow-gauge line through the Alps from France into Switzerland. 1000 w. R R Age Gaz—April 30, 1909. No. 4369.

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